MATERIAL SHORTAGES: PLASTICS

HEARING

BEFORE THE

SELECT COMMITTEE ON SMALL BUSINESS
UNITED STATES SENATE

EIGHTY-SECOND CONGRESS

FIRST SESSION

ON

IMPACT ON SMALL BUSINESS OF
MATERIAL SHORTAGES

PART 3

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MATERIAL SHORTAGES: PLASTICS

TUESDAY, JANUARY 23, 1951

UNITED STATES SENATE,
SELECT COMMITTEE ON SMALL BUSINESS,
Washington, D. C.

The committee met, pursuant to adjournment, at 10 a. m. in the Senate caucus room, Senate Office Building, Hon. John J. Sparkman, presiding.

Present: Senators Sparkman (chairman of the committee), Gillette, Hunt, Benton, Saltonstall, Thye, Hendrickson, and Schoeppel.

The CHAIRMAN. You may proceed, Dr. Kilgore.

STATEMENT OF DR. LOWELL B. KILGORE, CHEMICAL DIVISION, NATIONAL PRODUCTION AUTHORITY

Dr. KILGORE. The fundamental characteristics inherent in the plastic molding industry are singularly conducive to the operation of small-business enterprises. Included among such favorable characteristics are investment, space, and personnel requirements. But the item which provides the magnetism is the profit resulting from a manufacturing operation which produces a very high value-added increment at a low manufacturing cost. By one stroke of the piston, a plastic molding machine produces a commodity which may require 20 or more separate machine and hand operations to fabricate from metal. Thus, although the plastic molding material from which the molder makes the goods is much more costly, pound per pound, than competitive metals, the wide divergence between respective costs of manufacture tips the balance strongly in favor of the plastic goods molder.

The foregoing basic premises, plus the fact that there are no fundamental patent monopolies which limit the entrance of new companies into the plastic injection molding business, has produced a new and large industry in this country. These small independent companies, which now comprise the preponderance of the plastic molding establishments, are located throughout the United States. Frequently, such a manufacturer is the chief, or sole, employer in a small town.

However, the manufacture of the molding powder which the above molders use as their principal, if not only raw material, is quite another matter. Although plastics seem to have appeared like magic in American industry, the complicated research and development work prosecuted by the staffs of the large chemical companies (known as material producers) provide the real story of the birth of the many plastics we find everywhere in our daily life. A few large companies are responsible for the development of the plastic industry and they, in turn, depend upon the large number of small-business molders as

their customers throughout the country. Large and small businesses are therefore uniquely mutually interdependent in the plastics industry and commonly share their fortunes.

The chemical history of the industry is replete with success stories of new discoveries and developments. Plastics is no exception. However, as the complexity of the materials which go into the new plastics has increased, the reduction to commercial practice has become much more expensive and time consuming to the materials producers. As a result, certain of the latest molding powder developments require a large capital investment, including expensive and complicated manufacturing equipment. The chemical producers have therefore been unable to meet the demands which have come from an avid public acceptance of the newer molded products. Likewise, basic chemical raw material limitations have also placed ceilings on the amounts of certain plastic molding supplies available during recent months.

The sudden upsurge of business during the last half of 1950 was therefore quickly felt by the plastics industry and particularly by those molders who use the most recently developed materials. These shortages, which were caused by a sharp rise in demand, are now further aggravated by the new demands for use in the defense program. Inasmuch as the number of individual plastics, each comprising various combinations of the specific monomers (to form polymers and copolymers), constitute a legion of commercial items, it would be an impossible task to accurately evaluate the over-all potential impact which may be reasonably expected as a result of the defense demands even if such demands were fully known. Certainly the range of demand will vary all the way from a few percent to the total production capacity for certain individual and proprietary plastics.

A specific example of the effect of the defense program demand for a plastic material which was already in short supply, is that of the styrene based plastics. Since the demand for polystyrene molding compounds has advanced so rapidly during 1950, it is difficult to use figures to illustrate the above effect of the rubber program. Roughly speaking, this rubber program will divert sufficient styrene away from plastics to make it necessary to revert to the mid-1950 styrene plastic production rate.

From the foregoing rather brief recital of the situation which now obtains in the plastic molding business, it is evident that the problems pertaining to keeping the plastic molders in business during the transition to defense mobilization is of mutual concern to both material producers and the molders. Furthermore, it is evident that competition does not exist between the large material suppliers and the small molders but rather that these two groups cooperate to further their mutual interests.

This division is fully aware of the foregoing interrelationship between large and small manufacturers as respective suppliers and consumers and has therefore seen fit to rely upon this unique arrangement in order to provide equitable distribution of those raw materials which are essential to the plastic molding industry.

The fundamentals of such a voluntary allocation or pro rata distribution system by the materials suppliers, which have been insisted upon by this division, include: (*a*) The right-of-way policy for all defense orders in accordance with the DO rated order system. (*b*) The

fulfillment of requirements for plastic products which have an acknowledged essential public health welfare end use. (*c*) Voluntary provision of materials by the suppliers for cases of extreme hardship as a specific situation.

DO rated orders and directives for specific contract performances have fully provided for by the material suppliers as the first step in their distribution. The amount remaining has then been distributed, or as more commonly referred to voluntary allocation, on the basis of previous purchases by their respective customers. It is obvious from the foregoing discussion that the amount so allocated to individual customers is quite likely to be insufficient to meet their current desires. This is to be expected in view of the greatly accelerated public demand which now generally obtains.

By and large, a very good job has been done. This division has worked closely with the material suppliers by means of both industry conference and consultations. Furthermore, this division has provided assistance in all of the unusual hardship cases and those of urgent public necessity which have been brought before it.

The ultimate solution of the shortage problem lies in an increased production of molding materials. New or expanded production facilities are under construction for most of the plastic materials now in such short supply. In the case of the styrene and phenolic materials, such expansions are limited by the availability of benzene. It may be pointed out, however, that American resourcefulness, for which the chemical industry is particularly noted, has more than doubled the production of styrene over the design capacities of the wartime rubber program plants. That increase has been a real life saver to the styrene plastics industry. Likewise, it appears that unless the demands are far greater than are now anticipated, the plastic materials suppliers will be able to bring themselves into a fairly good position by the latter part of this year, within the framework of basic chemical availabilities.

The CHAIRMAN. Senator Hunt.

Senator HUNT. I have no questions.

The CHAIRMAN. Thank you very much, Dr. Kilgore. Did you have any further suggestions?

Dr. KILGORE. No, sir, not at this time.

The CHAIRMAN. Thank you very much.

Our next witness is Mr. William Dixon of the Dow Chemical Co.

Mr. Dixon, do you have a prepared statement, or do you wish to make your statement orally?

Mr. DIXON. I would prefer to, Senator.

The CHAIRMAN. Just proceed in your own way.

STATEMENT OF WILLIAM DIXON OF THE DOW CHEMICAL CO.

Mr. DIXON. The Dow Chemical Co. is a material producer. We sell the molding materials to the small molders throughout the country.

The CHAIRMAN. Do you do any processing?

Mr. DIXON. No. We restrict ourselves to manufacturing.

The CHAIRMAN. I mean fabrication. You are entirely in the producing field?

Mr. DIXON. Yes, sir.

This plastics industry, gentlemen, has been misunderstood throughout its growth. Obviously, an industry like this which has its color and its spread through many, many industries, has lent itself very admirably to sundry elements, and there is a good deal of misunderstanding about it. Consequently, we appreciate the opportunity of talking to you today about this industry, which in spite of its extreme youth, has already grown to a position of importance in the national economy.

The molding end of this industry is almost entirely within the realm of small business. The reason for our concern is that many of these small businesses are threatened with extinction because of the conversion of their raw materials. Certainly, none of us expect the continuance of business-as-usual, but our chief interest is that in the development of the defense program we be wary of moves which cripple a segment of the economy which we may later have to depend on during the defense program.

We have every reason to believe that polystyrene, which is the product which I would like to talk about, will be used in the defense program. It is by far the fastest growing member of this family of plastic materials, and it is manufactured by four chemical companies who purchase benzol, benzene from steel or petroleum companies.

This is a sample of styrene. We go through a process known as polymerization and manufacture polystyrene, which looks like this.

The CHAIRMAN. Before you get too far away. You say you purchase it from the petroleum or steel companies? The steel gets it from a byproduct of coke?

Mr. DIXON. That is correct.

From this point, small business takes over. They take over by operating injection molding machines. I can demonstrate that over here.

They are fed in this hopper. They follow or fall on down through this.

Mr. DIXON. The granules go down through the tunnel into a heating chamber, where they become plasticized under heat. The ram comes forward pressing the heated plastic through a spoon into a mold. The mold remains closed until the plastic has cooled. It then opens, and you remove the molded part. That is the injection molding process.

Senator HUNT. What material is the mold made from?

Mr. DIXON. The mold is made of steel, Senator.

Senator HUNT. Is heat the only thing that is applied there?

Mr. DIXON. That is correct.

Senator HUNT. The granules are put in there, heat is applied and then pressure.

Mr. DIXON. Forces it into a mold and it then cools and it is then removed.

Now, there are two aspects of this process, which I think are important to you.

No. 1: When the part is removed, it is practically a complete part. It requires no further finish. For instance, this bowl comes out just as you see it.

The other thing which is important is that in the morning this machine could be making bowls, for instance, and in the afternoon, by

simply removing the mold, it might be molding parts for proximity fuzes, let us say.

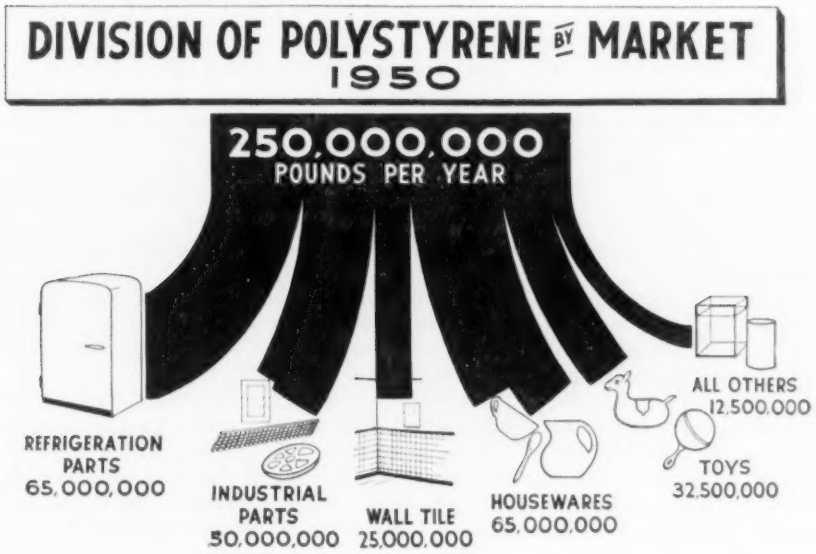
Senator HUNT. Is there not any polishing or finishing process after it comes out of the mold?

Mr. DIXON. No, just a simple operation which is required to cut off the gate of the spool, otherwise, the part is completely finished.

Senator SALTONSTALL. In color?

Mr. DIXON. That is correct.

Now, by the use of these powders, and this process, molders have manufactured all of these things which you see before you, a host of intricate colorful, useful objects. Some of these products the molder himself markets through retail channels—such as these. Others, he sells to other manufacturers who use them as component parts of their own manufactured products.



Now, may I have the chart? During 1950, we manufactured approximately 250,000,000 pounds of polystyrene. This is our guess where that product went.

About 65,000,000 pounds went into refrigerator parts, complicated parts later assembled into refrigerator parts.

About 50,000,000 pounds went into such other industrial components as, batteries, radio cabinets, television parts, and so forth, and so on.

About 25,000,000 pounds went into a very ingenious use which did not exist in 1945, except in one man's mind, the idea you could make a satisfactory wall tile out of polystyrene. It started out from nothing in 1945, and soon consumed about 25,000,000 pounds in the last year. It is an accepted building material today.

The other large market is what we call the houseware field, which includes such things as the bowls, the refrigerator dishes and the canister sets over there.

Toys consumed about 32,500,000 pounds. And all other uses were around 12,500,000.

I think it should be mentioned that from one-third to one-half of the quantity that went into housewares was used in the preservation of foods, and from that angle it might be important to us later on.

It is very difficult for us to separate the trivial from the significant in this business, as you can imagine. For instance, in front of you you will see what appears to be a polystyrene spoon. This was developed about 2 years ago to replace the die-cut wooden spoons, which you have received with the little cartons of ice cream. Today, it is a standard item of issue by the Quartermaster in field ration kits. It is immediately convertible. You just change the color of the material fed into the machine and it will come out your Army color.

Senator SALTONSTALL. Would you consider that a must from the point of view of health, in view of Dr. Kilgore's statement?

Mr. DIXON. Senator, I am afraid we would have to be guided by the Government's feeling about that.

Senator SALTONSTALL. That is almost like passing the buck. What is your opinion?

Mr. DIXON. We are very interested in its continuance.

Senator SALTONSTALL. As a health matter?

Mr. DIXON. Yes.

The CHAIRMAN. If the defense ordered some of these from a manufacturer, of course it would come within the must list.

Mr. DIXON. That is right. We supply defense orders first from our production.

You will have noted, I am sure, that a great many of these items are not what we might in any way term to be essential to a civilian, defense effort, or a mobilization economy. We are not concerned with the continuance of manufacturing these items as such.

Now, let's take a toy automobile. We are not concerned with keeping that toy automobile going, but we are concerned with providing enough material to be sure that that company, which today is depending for its existence on the manufacture of that toy automobile, can keep itself together until such time as it can remove the mold and make something which is more essential and more required by the economy.

We have among our molders an extremely vulnerable industry. To understand it, I think you should know a little about the growth of polystyrene.

The first injection machine, such as these, came into this country between 1930 and 1935. By 1936 the business was just beginning. In that year, I believe, 60,000 pounds of injection molding materials of all sorts were being used. The general purpose material being used at the time was cellulose acetate, which is one of a group of celluloses. These products have grown since that time. Today, they are manufactured to the extent of about 8,000,000 pounds a month, but they are themselves very short, and in World War II had a number of essential uses, consequently, the molders cannot look to that material as a buffer against the possible shortage of polystyrene.

Polystyrene, itself, was first manufactured in this country around 1938. It grew very slowly in its first years to about 2,000,000 pounds annual production by 1940 or 1941. At this point, in early World War II, we found that the country could not any longer count on

natural rubber being imported from the Far East. It was essential that we quickly and efficiently build a large synthetic rubber program, which the Government promptly set about to do, constructing facilities for the manufacture of styrene up to about 30,000,000 pounds a month, if my memory serves me correctly. Later technological improvement in the plant made it possible to increase their output to about 50,000,000 a month.

The greatest significance of polystyrene in World War II lay not in itself, because it was not very broadly used, but because we had gained production experience by manufacturing it to make it possible for the Government to build the styrene plants very, very rapidly. And because of its newness, polystyrene was not broadly applied. It had to compete with rubber as an end-use. Nevertheless, by 1943 or 1944, around three to four hundred thousand pounds were being used in the military effort.

With the end of the war, the need for synthetic rubber diminished and, of course, the manufacturers of styrene for that use were curtailed.

Meanwhile, the injection molding industry had gotten a foothold and grew very rapidly during the postwar years. At the end of that year the consumption of polystyrene had jumped to about 2½ million pounds per month, which was about twofold growth.

Since that time consumption has increased very rapidly. The next chart, please.

Annual consumption of polystyrene, 1945–50

	Pounds		*Pounds*
1945	22, 000, 000	1948	145, 000, 000
1946	66, 000, 000	1949	183, 000, 000
1947	94, 000, 000	1950	[1] 250, 000, 000

[1] Estimated.

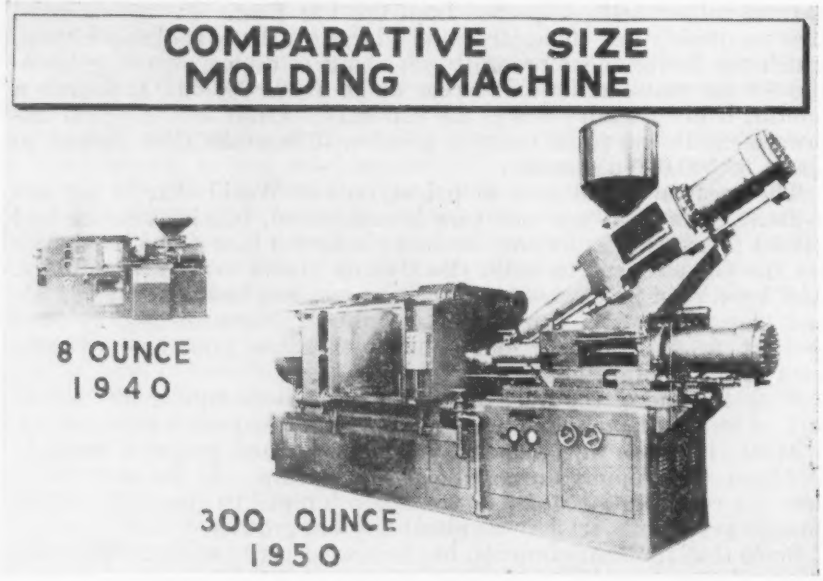
This next chart displays graphically the annual consumption of polystyrene. You will notice this is 22,000,000 pounds, 94, 145, and 180, and then finally 250,000,000 pounds, in a short 5- or 6-year span.

This growth, in our opinion, has come about for several reasons. Obviously, the economic advantages of this process which delivers a completely finished part without the need for expensive further finishing operations has made the product manufactured by that method economically desirable during the past 5 years.

Improved types of polystyrene as well as improved types of machinery have been developed during those 5 years. They speeded up what we call the molding cycle—that is the time required for the complete series of events, which transpired here in this diagrammatic presentation of the molding process—approximately 50 percent.

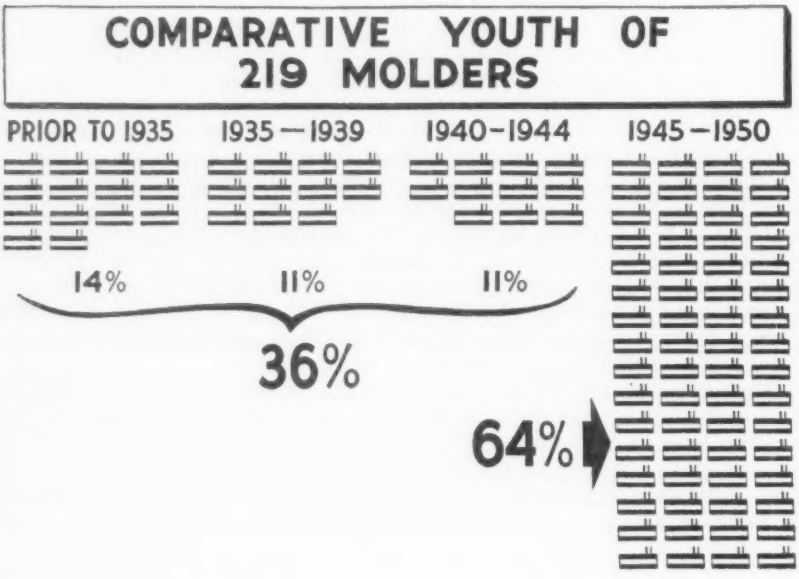
Now, what that means is that out of the same molding machine, today, which you were operating in 1946, you can produce about 50 percent more finished parts per hour.

The manufacturers have consistently improved these machines and have consistently increased their size. In 1946, at the end of the war, the average machine size was this 8-ounce machine on the left. Today, we are seeing in the industry the installation of these new giant 300-ounce machines. This increase in size has made possible our entry into brand new fields—around 1945.



In 1945, because of the size limitation alone, we could only make small parts in those machines. Today, we can make huge parts, something like this refrigerator breaker frame, or this large battery in front of you.

This rapid growth has had a profound effect on the small businesses who make up the fabrication industry, as you can imagine. Most of them are young companies. The next chart, please.



This is a survey that we made of a group of companies, collected at random. There are about 700 injection molders in the country. Out of 219 of them, 64 percent have been founded since 1945. In other words, they are 5 years old. Another 11 percent have been founded since 1940; making three-quarters of the business 10 years old, or younger.

In addition, the majority of them are small companies, as you define them. The next chart, please.

The figures quoted in your report cover the entire business of plastics, including fabrication, injection molding, and impression molding.

This is a sample of 226 injection molders, which shows that 85 percent of them fall under the 500—about 15 percent over that.

226 STYRON MOLDERS

NUMBER OF EMPLOYEES		DOW (NOV. 1950) CUSTOMERS PERCENT BY GROUP	
1-4		5.3	
5-9		4.8	
10-19		10.6	SMALL
20-49		26.0	
50-99		15.5	
100-249		15.1	
250-499		7.1	
500-999	15.5	4.0	LARGE
1000-2499		4.4	
OVER 2500		7.1	

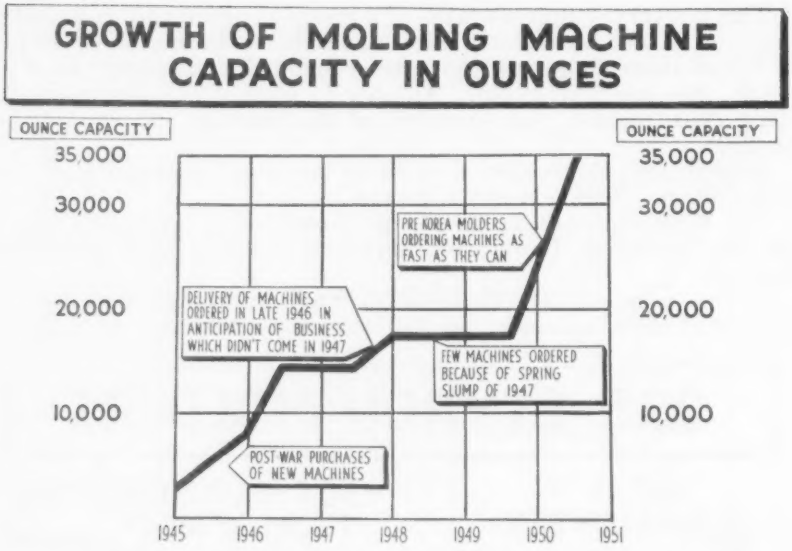
All of these companies have been faced with the need for practically constant expansion in the past 5 years just simply to keep up with the phase of the business. In a business that is moving as fast as this, if you do not move forward, you lose pace; if you stand still, you move backward.

Senator SALTONSTALL. What is the extent of the product you use—15 percent—as compared with the other 25 percent?

Mr. DIXON. Senator, I do not have those figures. I believe we can develop them for you. I do not know.

Would you like to turn to the next chart, please? The next chart shows the development of injection molding machine capacity in the United States. This is rated in terms of ounces. The machines are rated in terms of ounces.

The 8-ounce machine, for instance, delivers approximately 8 ounces in a single stroke of the piston. Theoretically, the 300-ounce machine delivers approximately 300 ounces in a single stroke of the piston.



Starting at the end of the war, there were very heavy purchases of new machines. This industry had a slight depression, shall we say, in the beginning of 1947, when it was reconverted from wartime products to peacetime products. Nevertheless, machines ordered in late 1946 in anticipation of new industry which did not come in 1947, were delivered prior to the beginning of 1948.

That capacity was utilized through 1948 and 1949. Along about the middle of 1949 orders for new machines generated by these economic factors and the growth of the business came in and, as you can see, the capacity has really skyrocketed.

These machines are expensive. For instance, the 300-ounce machine, which I showed you, costs around $125,000–$130,000 for the machine itself, plus approximately forty to fifty thousand dollars for installation and auxiliary equipment.

Now, the heavy capital requirements made on these small companies are reflected in their financial structures. The next chart, please.

Average balance sheet, 72 molders (as of Sept. 30, 1950)

Assets:	
Cash	$17,500
Accounts receivable	60,900
Inventories	52,600
Total current assets	131,000
Fixed assets less depreciation	111,600
Total assets	242,000
Liabilities:	
Accounts payable	44,200
Owed to banks	13,700
Other loans	12,500
All other current liabilities	24,200
Total current	94,600
Funded and mortgage debt	27,400
Net worth	120,600
Total liabilities	242,600

This is an average balance sheet for 72 injection molders as of September 30, 1950. I think the points which are significant are these:

On the average these companies showed $120,000 net worth. That is the money which they themselves had invested in the business. Of that $120,000, $111,000 is invested in plant fixed assets. This has left them with an extremely low working capital; leaving about $9,000 of their own money to operate on.

They found that they could not operate on that small sum of money. Consequently, they have gone to other people and secured money.

Total current liabilities, $94,600. Funded and mortgage debt of $27,000. This means that other people have provided the money on which these companies operate.

This does not differ particularly from many businesses except in in the matter of degree. The money was extended to these companies in the confidence that their operations would continue profitably, and the ability of the company to hold their loans and mortgages depends, of course, on their ability to operate profitably.

In a highly strained financial situation as this, creditor's confidence is extremely sensitive, and molding companies are more vulnerable than most everyone else even in a short disruption of operation. We believe these aspects of these companies are unique.

A similar average balance sheet for rubber shows slightly more than 50 percent of net worth invested in fixed assets and current assets of four times current liabilities.

Paint manufacturers—I do not select these to take any cracks at these particular industries, but they were the only figures that were available to us—on the average have less than 50 percent of their net worth invested in plant, and their current assets covered their liability by more than 4 to 1.

My accounting friends tell me that an average balance sheet really does not mean anything.

Senator HENDRICKSON. How many employees would come in this size?

Mr. DIXON. Oh, I guess between 50 and 100 people.

Financial aspects of several typical molders of various sizes

	Net worth	Fixed assets after depreciation	Liabilities
A	$25,000	$19,000	$13,000
B	47,500	47,000	17,000
C	110,000	80,000	100,000
D	150,000	135,000	80,000
E	360,000	290,000	131,000
F	490,000	314,000	800,000

We selected the balance sheets that were available to us. There are six companies of varying sizes in this compilation. They list their net worth, fixed assets after depreciation, and their liabilities.

Here is a very small company of $20,000 net worth, with $19,000 of their money invested in this extensive plant, carrying liability of $13,000.

Senator THYE. Can you foresee in the future that the machine will cost you less money?

Mr. DIXON. I do not know about that.

Senator THYE. The reason I am asking you the question is because it is relatively a new field.

Mr. DIXON. Yes.

Senator THYE. Therefore, every machine must be pioneered.

Mr. DIXON. There is a high degree of technological improvement going on which costs a great deal of money. I am sure that must be paid for by the manufacturer.

Senator THYE. In due time, after you have gotten all the bugs out, the machine will, possibly, cost less, unless the cost of material, labor, and so forth, is greatly increased.

Mr. DIXON. We certainly all hope for that.

The bigger you get the worse you get. Here is a half a million dollar company with $314,000 in plant, with $800,000 of other peoples' money keeping the business going.

The CHAIRMAN. What would that $800,000 represent over and above the $314,000?

Mr. DIXON. It would represent the investment in holdings. It would represent, perhaps, losses taken in a time when prices were not right, when they could not operate profitably. It would represent, perhaps, expensive investments made in merchandising these products. It is a highly competitive business.

The CHAIRMAN. In other words, it would represent a company that has gone through some pretty rough days, and is trying to recover; is that right?

Mr. DIXON. The entire history of this business has been rough, Senator. It is growing so fast, and the competition is so terrific.

We say around our company that we used to expect crises only on Friday afternoon. Today, we expect crises starting at 8 o'clock Monday morning and continuing right on through to 5 o'clock Friday night. This business operates that way.

Senator SALTONSTALL. What is the life of one of these machines, theoretically?

Mr. DIXON. I would guess that the machine could be operated for quite a number of years, 10 or 20 years.

However, technological improvements tend to obsolete them very rapidly.

Senator SALTONSTALL. Well, I asked that question because the liabilities of this business, as I see it, most of it goes into the capital——

Mr. DIXON. A very high productivity per employee.

Senator SALTONSTALL. Therefore, if the machine lasts out, this liability would come down, and the net worth would go up over a period of years, if there are not any technological improvements.

Mr. DIXON. Exactly. Assuming one more thing, that they have enough material to run.

Senator SALTONSTALL. But the fact is: This high liability is due to the fact that it is a new industry, and the machine has not had a chance to pay for itself.

Mr. DIXON. I believe that is correct.

Senator HUNT. That $800,000 would represent, also, bank obligations, would it not?

Mr. DIXON. Yes.

The CHAIRMAN. Even at that, if it were a healthy concern, there ought to be a reflection in these other two columns.

Senator HUNT. Well, I am wondering if this industry is not running true to form as all new great industries——

Mr. DIXON. I believe that is true. Senator Sparkman, I would not want anybody to believe for a moment that we feel that the injection industry is not a healthy industry. It is an extremely healthy industry. The very fact that other people will loan it money in these sums is significant, I believe.

The CHAIRMAN. I was referring to the one company whose statement is given on the bottom line. It seems to me that in a healthy company—I am not an accountant—but, it seems to me that in a healthy company your figure on the right, liabilities, ought to be offset somewhere with net worth, fixed assets, inventory—there ought to be something to represent that figure. Otherwise, they are in debt.

Now, that is the question I want to ask you. I have not read this report. I have only seen newspaper reports of it. I go pretty strongly with a newspaper report, as we all do, I guess, in getting our information.

A House committee recently issued a report in which certain statistics were set forth relating to big business, and little business. I remember particularly what it had to say about steel. It showed that so far as the investors were concerned, the smaller steel companies had been better to them than the bigger companies, and indicating, or implying, that the smaller companies were really more healthy and sounder operations from the standpoint of investment and security, money making, and so forth, than the larger companies.

I am just wondering if these figures, certainly, the last line, might indicate that to be the truth.

Mr. DIXON. Senator, I would not care to debate the case with you, obviously. I believe you have witnesses coming along who are going to discuss their own financial aspects. I am sure that among them you will find one or two who reflect the situation which looks bad on the surface, as this does, but actually it is entirely an aspect of the growth and the increase in production that you see in front of you.

Senator HUNT. May I ask Mr. Dixon? What shape are your accounts receivable in? Are these small industries paying you promptly for the raw materials?

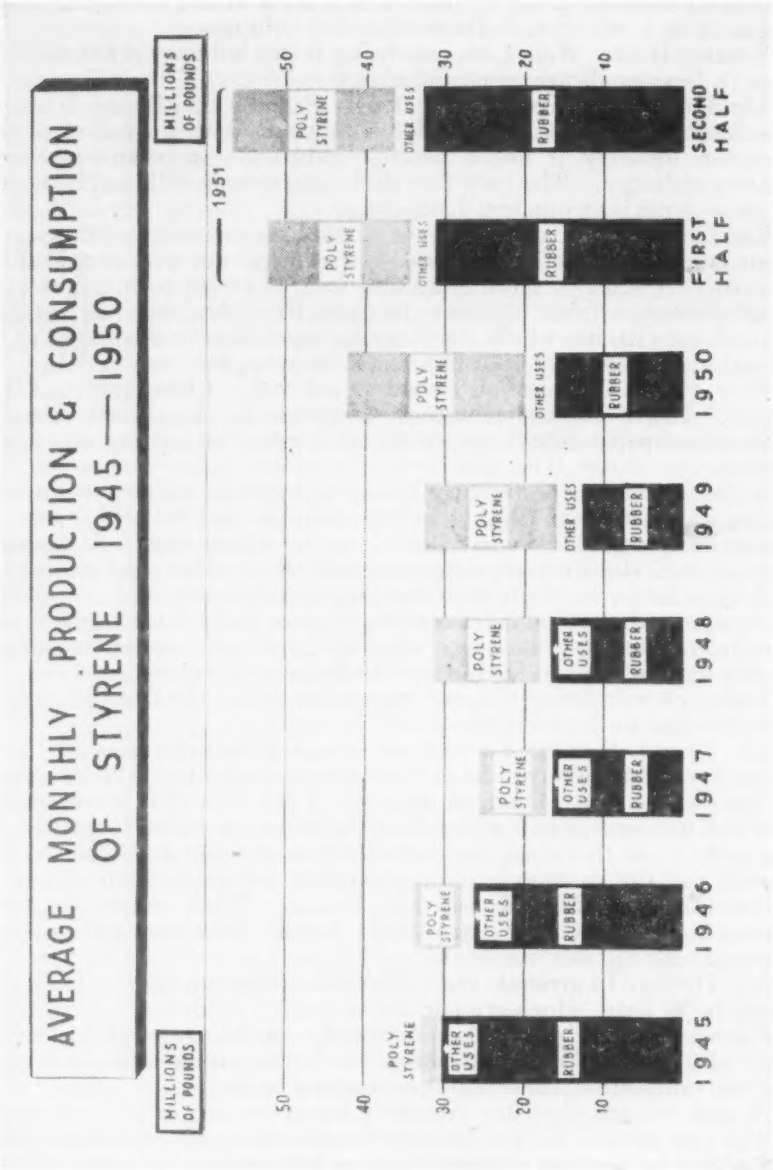
Mr. DIXON. In general; yes. The collections run slow. They run closer to 30 days, which are our terms.

Fortunately, we have had an extremely small loss due to bad debts year after year. We are banking on the ingenuity and drive, and aggressiveness that these small companies have.

As you can see, they are extremely ingenious.

The CHAIRMAN. Do you have to finance many of these firms yourself, either by making outright loans or by carrying the——

Mr. DIXON. No. The only financial assistance which we would offer them would be an extension of terms.


AVERAGE MONTHLY PRODUCTION & CONSUMPTION OF STYRENE 1945 — 1950
MILLIONS OF POUNDS
MILLIONS OF POUNDS
1951
50
40
30
20
10
POLY STYRENE
OTHER USES
RUBBER
1945
1946
1947
1948
1949
1950
FIRST HALF
SECOND HALF

This is a history of the monthly production and consumption of polystyrene from 1945 to 1950.

As you recall, at the end of the war our polystyrene production was going to the manufacture of rubber. With the termination of World War II, the requirements of rubber began to decline, hitting bottom, late in 1949.

In the meantime, the growth of polystyrene consumption brought up styrene consumption, equally in 1949 what they have been manufacturing during the war, and really taking off in 1950, and showing an increase on the average, I believe, of from 31,000,000 pounds a month total production to 42,000,000.

Currently, we are operating somewhat over 50,000,000 pounds a month. You will notice the abrupt increase in the quantity required from rubber as between the average monthly requirement in 1950, which, I believe, was 16,000,000 pounds, to the average monthly requirement in the first half of 1951, which is 31,000,000 pounds, and increasing to 32,000,000 pounds in the last half.

You will also notice that the manufacturers have already increased styrene output to offset to a certain extent what was taken by rubber, and they propose to do so further.

However, as far as polystyrene is concerned, and somewhat contradictory to the statements made by Dr. Kilgore, the average polystyrene quantity available during 1950, was 22,500,000 pounds per month. The average during the first 6 months of 1951, I believe, will be about 18,000,000 pounds. The average in the last 6 months should run around 20 or 20½ million pounds, assuming that further defense requirements do not divert benzol and benzene.

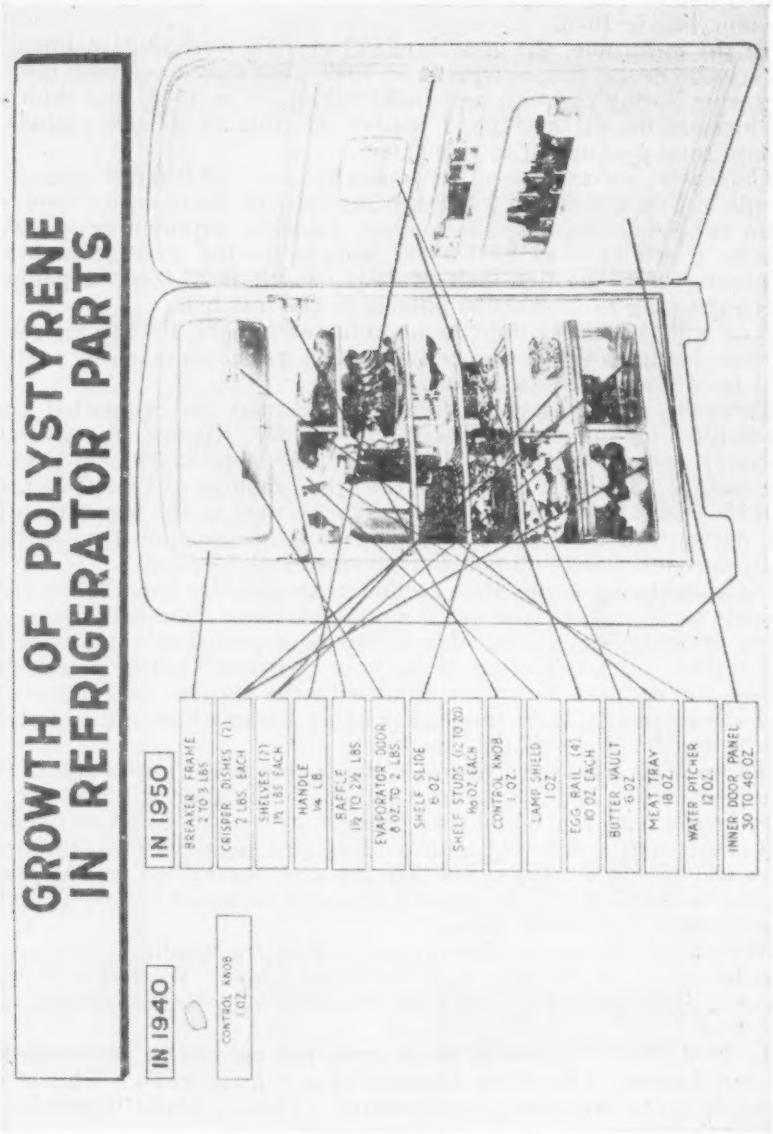
Now, taken by items, that decline in availability from 22½ million pounds to 18 million pounds does not look like very much, or such a great calamity, especially, since it can be expected to come back to 20½ million pounds later on in the year. It would not be a calamity unless you coupled it in your mind with the extreme rate of growth and the extremely high financial pressure under which most of these young and small companies operate.

The current shortage creates serious doubts in our minds and in the minds of many molders as to whether or not they will be able to survive the next 4 or 5 months. Some may be able to protect themselves by securing defense business. But here, again, we are confronted with the special situation, because the need for rubber was so great during World War II. We have practically no people behind us in the manufacture of military parts.

We all feel, however, that injection molders molding polystyrene will be used very broadly in the defense effort. We feel that way because of the experience we had, for instance, with the refrigeration industry.

In 1940, about 1 ounce of polystyrene was used in a refrigerator for control knobs. This is an example of a control knob. This is an example of one manufacturer's product. There is about 18 pounds of polystyrene involved in that refrigerator.

What we think is significant is that the refrigeration engineers operate in a very similar manner to the military engineers in that he must buy materials to rigid specifications, rigid performance specifications.

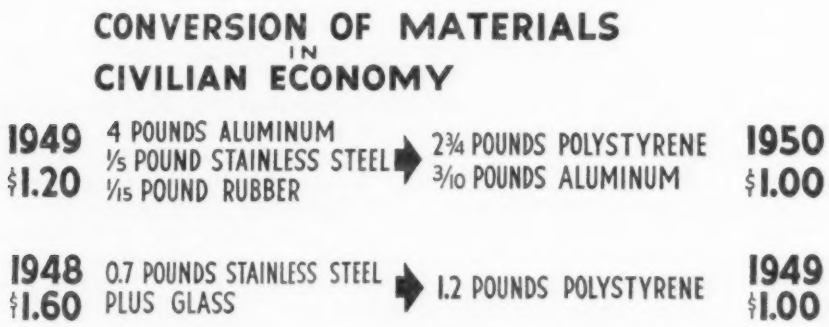

GROWTH OF POLYSTYRENE IN REFRIGERATOR PARTS
IN 1940
CONTROL KNOB 1 OZ.
IN 1950
BREAKER FRAME 2 TO 3 LBS
CRISPER DISHES (2) 2 LBS. EACH
SHELVES (2) 1½ LBS EACH
HANDLE ¼ LB
BAFFLE ½ TO 2½ LBS.
EVAPORATOR DOOR 8 OZ. TO 2 LBS.
SHELF SLIDE 6 OZ.
SHELF STUDS (6 TO 20) ½ OZ EACH
CONTROL KNOB 1 OZ.
LAMP SHIELD 1 OZ.
EGG RAIL (4) 10 OZ EACH
BUTTER VAULT 6 OZ
MEAT TRAY 18 OZ.
WATER PITCHER 12 OZ.
INNER DOOR PANEL 30 TO 40 OZ.

Senator GILLETTE. Mr. Dixon, may I ask you at what point does styrene become polystyrene?

Mr. DIXON. That process is accomplished in our plants, Senator. It is done purely by applying heat to the styrene, and it is ground up. That is our share of the process.

Many people feel that the use of plastics in refrigerators is simply to provide decorative appeal. This part I am holding is a strictly functional part of one refrigerator. It was originally manufactured from aluminum and stainless steel and rubber. Show them the next chart.

In that process it required about 4 pounds of aluminum and one-fifth of a pound of stainless steel and one-fifth of a pound of rubber. It was designed to be manufactured in polystyrene. It now consumes 2¾ pounds of polystyrene, and about three-tenths of a pound of aluminum.



Why did they do it? They went to it to avoid the expensive hand operations involved in the assembly of aluminum and stainless steel. Simply because they eliminated the today's labor price—if you paid a dollar for this, you would pay $1.50 for the aluminum and stainless steel combination.

Incidentally, you will notice in close examination of this, molded in are the lugs and bushings which are required for prompt and fast assembly. The refrigerator companies save a lot of time in their own assembly operation. This originally was made of glass, and seven-tenths of a pound of stainless steel. It now consumes one and two-tenths pounds of polystyrene. Because of the elimination of the hand labor in the assembly, and comparable costs, today's dollar, it is about $1 for this versus $1.50, or $1.60.

We think fundamentally here are savings which are important for the defense economy. In terms of these, a saving of manpower, production, and assembly, and a saving of critical metals like aluminum and stainless steel, and a saving of electrical power.

For instance, it takes 34 times as much electrical energy to make 1 cubic foot of aluminum as it takes to make 1 cubic foot of polystyrene.

It takes about 25 times as much electrical energy to make 1 cubic foot of steel as it does to make 1 cubic foot of polystyrene.

Senator SALTONSTALL. If they are purchased for the defense effort, what is your recommendation to the defense authority on the use of this polystyrene?

Mr. DIXON. Senator, the use of the injection molding, polystyrene at the moment, because of our inexperience of it, is pretty much largely in the hands of the development engineers, contractors, subcontractors, and in Government laboratories. Many of the projects are classified projects.

We believe that the use of this material is going to come in the defense operation, but we seriously question whether it is going to come fast enough to permit us to save these injection molding companies from financial extinction so they can have the service when the defense requirement——

Senator SALTONSTALL. What is your recommendation to this committee as to its recommendation to the defense authority?

Mr. DIXON. I believe that the only thing that we could suggest is identical to what was suggested by the suppliers in previous days of our hearings. We need more haste. We need an elimination of red tape. We need a good all-out effort. I am afraid that is very general.

The CHAIRMAN. There is a great bottleneck at the moment.

Mr. DIXON. At the moment we could be supplying a lot more polystyrene except for the Executive order of the President. The rubber program has been reactivated to a higher rate. The styrene is going to rubber rather than to polystyrene. Production has increased sharply during late 1950 in spite of the extremely short raw-material situation. We expect further gains in 1951. We believe they will be less than adequate to offset the expended requirements from rubber and will become available too late to prevent a serious lag of balance between the output and the capacity consumed.

There probably will be further conversion of raw materials. We believe that some means should be devised for an equitable distribution of the styrene to permit the life of this young, growing, vulnerable industry.

Senator SALTONSTALL. Styrene is only used in rubber. What you say is: We have got to recommend to the defense authority to cut down as far as we can the use of styrene in rubber so as to keep these companies alive until you can increase the production of polystyrene.

Mr. DIXON. Senator, the Society of Plastic Industry, which is an organization of producers and fabricators, has given a great deal of thought to this conflict between plastics and rubber in the past 6 months, and have prepared a report which has been filed with Dr. John Steelman, Assistant to the President, incorporating recommendations as to the possible modification of the rubber program which could be made.

If you sincerely wish to assist the industry, I believe that commendation of that report would be extremely helpful.

The CHAIRMAN. Are there any further questions?

Senator GILLETTE. Mr. Chairman, I wanted to ask one or two questions.

I am particularly interested, Mr. Dixon, in your closing statement, the need for an equitable distribution of this material.

Of course, as in all processing, this industry, like others, is dependent on its labor supply and its material supply. Our committee is charged to look into this situation and the various industries and the impact of the war economy on them.

Now, first I want to inquire as to the labor. Does it take any special skill to operate one of those machines?

Mr. DIXON. Oh, yes, Senator. Skilled labor is hard to acquire. Most of the molders tell us they cannot acquire them with academic training. They must be trained in our own plants. That skilled labor force, I think, is one of the things with which you should be concerned as a small business committee.

Senator GILLETTE. That appeared evident to me from the testimony given here, and in the table to which the chairman has alluded. The total employees of these establishments is 30,000. Of course, most of them are small plants. But out of 1,360 establishments, 6 of these employ over 40 percent of these 30,000. Those are the ones between 1,000 and 2,500 employees. So out of your 30,000 employees in the industry, this molding industry, over 40 percent are employed by 6 companies out of 1,360. So there will unquestionably be competition for that skilled labor, will there not?

Mr. DIXON. I suspect such will be the case.

Senator GILLETTE. So that is a serious matter.

Now, in the matter of the availability of material: The statement has been made by Mr. Kilgore that there was no effort being made to control, or allocate, the material that is necessary in this molding industry, that it has to depend on a voluntary basis.

Now, do you know, or can you give us any information, as to whether any of these large companies that are manufacturing styrene and polystyrene—that is the essential element here—whether they have any financial interest in any of these molding companies?

Mr. DIXON. Well, I can only speak for my own company, Senator.

Our company has no financial interest in any of our customers, other than the credit arrangement, of which I spoke earlier.

Senator GILLETTE. The Dow Chemical Co. does not have any ownership in any of these molding companies?

Mr. DIXON. That is correct.

Senator GILLETTE. But you are not in a position to say whether the other suppliers of polystyrene control any of the molders where they would have a pecuniary interest or financial interest in the allocation of the material.

Mr. DIXON. My own opinion is that they do not. I think you will have several others, other producers here and——

Senator GILLETTE. Yes. So far as you know they do not——

Mr. DIXON. That is correct.

Senator GILLETTE. The picture you have presented here shows this new industry has been expanding rapidly; it is in a very delicate position financially. It cannot stand the shock of war economy either to its labor or material availability without some measure of security that we want to give.

I am not attempting to criticize you in any way. I am trying to find for the record how delicate this position is.

Mr. DIXON. I think it is very acute. This is a very unique situation among small-business concerns.

Senator GILLETTE. Then with the increased demand for synthetic rubber allocation, it is going to take a larger percentage of material and increase the difficult position of the molding industry.

Mr. DIXON. I believe that is correct.

Senator GILLETTE. That is all.

The CHAIRMAN. Thank you very much.

Mr. Edward Singer, of the Victory Manufacturing Co.; and Mr. Eli Jensen and C. R. Downs, of the Cambridge Molded Products; Mr. Herbert R. Galloway, of the Minnesota Plastics Corp.; and Mr. Carl Luster, of the Lincoln Plastics Corp.

Now, as I understand, this group represents the molders, the processors; and each one of you has a paper. I wonder if we might let each one make a brief statement; and then perhaps our questioning can be directed to the whole group.

All right, Mr. Singer, you go ahead, sir.

STATEMENT OF EDWARD SINGER, VICTORY MANUFACTURING CO., CHICAGO, ILL.

Mr. SINGER. Gentlemen, I appreciate the opportunity to appear before your group to relate first hand the effect of the present material scarcity on the operation of my company.

By way of introduction, Victory Manufacturing Co., the company which I represent, is located in Chicago, and has been in constant operation since 1933 as an engineering and selling organization.

I am a typical case of what Mr. Dixon was talking about. I might give it to you quickly, regarding this which seemed to be an unbalanced balance sheet.

The CHAIRMAN. Why don't you do that? Let us put your statement in the record as it appears; and you just use this as the springboard.

Mr. SINGER. I don't think Mr. Dixon will object. I am not too good as an auditor, but we happen to be a typical case.

I think he failed to mention the fact of why this unbalance, so to speak. For example, in our recent expansion program, which took about $375,000, we borrowed $300,000 on long term, which we had to do. Now, to keep current, our accounts receivables are in excess of our accounts payable. Therefore, we can still discount all our bills, and still keep going.

Also, the material people, such as Monsanto and Dow Chemical, and the rest of them, understand what the situation is; and they extend credit on that basis.

Looking at it quickly, the balance sheet doesn't show up.

The CHAIRMAN. There just was not enough of the picture shown; was there?

Mr. SINGER. That is right; and I think that that might explain it a little better. The sales are in such position that you have the quick assets to take care of your quick liabilities, so to speak; and then, of course, the integrity of the company, the people behind it, is based on their basis of credit.

I thought I would inject that to clarify that unbalance there.

The growth of the company can be charted by a steady upward curve closely paralleling the growth of the plastics industry. The

growth trend even up to several months ago augured well for increased employment and payrolls. Our experience, I am sure, finds many counterparts in our industry. In our case, we charted a program in the latter part of 1949 that entailed the procurement of additional equipment, increasing our capacity by over 100 percent. Orders for the equipment were placed early in February of 1950 and deliveries of the equipment to our company began in May of 1950. Please note that all this is before the Korean situation. Further and of even greater importance, it is well to note that the program of expansion was not undertaken just for the sake of expansion alone. Bona fide orders on the books made the expansion of facilities a must. Specific commitments to our customers had to be met. The confidence of our customers in our ability and integrity could not be violated. Hence the new equipment and increased production capacity. This expansion was about $375,000.

Our small company borrowed heavily to purchase the new equipment with the expectations of paying this loan out of earnings from the increased production. Because of the curtailment of materials available to us we face the complex problem of meeting increased financial obligations out of reduced production. Based on capacity, our company was allocated about one-half of the material required during the fourth quarter of 1950. By month, we received material as follows: October, 60 percent of capacity; November, 53 percent of capacity; December, 48 percent of capacity. The prospects for the first quarter of 1951 are even more bleak. Based on information available to us at this time we will receive approximately 25 percent of our material requirements.

The financial effect of the drastic curtailment in material availability for our company is best set forth by the following computations for a 12-month period:

	100 percent of material requirements	80 percent of material requirements	60 percent of material requirements	50 percent of material requirements
Sales	$1,000,000	$800,000	$600,000	$500,000
Cost of sales and overhead	940,000	823,000	703,000	640,000
Net profit	60,000			
Net loss		23,000	103,000	140,000

The CHAIRMAN. How many years could you operate at $140,000 loss a year?

Mr. SINGER. We couldn't operate too long, that is for sure.

In the event the present rate of material availability continues, the company will suffer great hardships. Indeed, if present prospects for material availability in the amount of 25 percent of actual need do not improve, the company may incur such losses as to render it insolvent.

Precautionary steps have been taken to safeguard the company's financial position by curtailing expenditures and reducing staff wherever possible. Our labor force today is reduced by 125 from our high point of 250 prior to the advent of material allocations.

I might add here that we are a combination. We do both the industrial work and the products. We merchandise, too. Our industrial work is about 75 percent. We must keep a staff of engineers on hand, whether we are doing the business or not, because they are specialized

people. We have to have them on hand to take care of all mechanical and engineering problems.

All of us in the plastics industry and particularly we of Victory Manufacturing Co. appreciate the efforts of the prime suppliers to be of assistance. Nevertheless, we can cite many examples of our inability to (*a*) accept orders, (*b*) accept orders requesting specific delivery dates and quantities, or (*c*) deliver on orders received months ago when materials were not on allocation, all because of the indefinite future with respect to materials.

I might add here that this additional equipment that we bought, we contracted, as I say, early in the year; and we had our orders before June; because it was an extensive tooling program amounting to over $50,000 for the particular customer, whom we had been servicing for 4 or 5 years; and they asked us to get this equipment. On the basis of that, we got a bona fide order for 1950. We are delivering now about 20 percent, I would say, or less.

It must be remembered that ours is a mechanical business and that preparation for the delivery of a finished product may involve any and all of the following preparatory steps: (1) Research and development, (2) engineering, (3) tooling, (4) material procurement, and (5) production.

The steps enumerated are time-consuming and must be taken into consideration in scheduling an operation. Consider, if you will, the economic loss resulting from preparatory functions that result in no production. For example: Victory Manufacturing Co. submitted a price quotation to X company on July 11, 1950, for parts ranging from 19,000 to 50,000 monthly.

You understand with a piece of this type it takes 10, 12, 14 weeks to tool the job. The quotation was favorable, and orders to proceed were received soon thereafter. Molds were scheduled for delivery in October, and production was to go forward immediately after approval of molds. The first production release was for 41,200 pieces—sales value approximately $50,000. Victory was able to provide our customer with only 5,000 parts. Then they proceeded to look further, with other suppliers, to get a few thousand here and a few thousand there, from any of them that had surplus material. That broke our hearts.

The remainder were canceled for lack of material. Please note that consideration of this order started on June 8, 1950, with a request for a quotation from the customer—before the Korean situation.

A similar situation resulted in the loss of $27,000, in billings per month. Again we had gone through the steps preparatory to production only to be forced to ask the customer to cancel the order because of material shortages. As stated before, we can cite many instances that have resulted in actual loss of dollars in operating with less than sufficient material, with the result that our ability to operate effectively in the discharge of our obligations, both economic and social, is seriously threatened. The solution to this problem, gentlemen, cannot long be delayed.

The CHAIRMAN. Thank you, Mr. Singer.

Now, will you just exchange seats with Mr. Jensen? You stay up here, because we may have some questions for you a little later.

Mr. Jensen and Mr. Downs are representing the Cambridge Molded Products.

We have a copy of your prepared statement, Mr. Jensen and Mr. Downs. I wonder if we could just print it in the record; and have you give us the highlights. I am pressing because our time is getting short. As I stated in the beginning, we are concluding today the debate on this foreign policy resolution; and all of us will have to go to the floor fairly early.

STATEMENT OF ELI F. JENSEN, PRESIDENT; AND CLIFTON R. DOWNS, SECRETARY, CAMBRIDGE MOLDED PLASTICS CO., CAMBRIDGE, OHIO

Mr. JENSEN. Mr. Chairman and members of the committee, I would like to point out the first paragraph which indicates that we have sales offices in the various cities; we have sales engineers in those offices; in which we have attempted to get not only our regular work, but also war contracts.

You will notice in the second paragraph our growth by percentage. That growth has been largely due to the refrigeration industry, and the type of equipment that we have been forced to get to meet growing demands.

You will also note the investment in equipment; the number of employees; and the amount of floor space, both in manufacturing and in storage.

On the second page, you will notice the facilities of the five plants which we use entirely for painting plastic parts, assembling plastic refrigerator parts, fabricating fiber glass, and construction and repair of molds. That is all a part of our work, which is necessary to our manufacturing.

You will also note that we require 120 people there.

Also, in the third paragraph, we mention, if our allocation is not increased, we will be forced to lay off many of our personnel, in whom we are vitally interested.

Also, in the last paragraph on page 2, one of the things that is very critical is the tool and die makers for the plastics industry; and we have, in the past 2 years, kept steadily employed 35 experienced, well-qualified tool and die makers, who are very necessary to the plastics industry.

Also, on page 3, in the second and third paragraphs, you will note that the shortage has created a great alarm and has brought a violent reaction from the refrigerator industry; and without the complete parts, the refrigerator cannot be completed.

Also, in the last paragraph on page 3, you will notice that the population of our city of Cambridge is 14,693; and there are 3,263 people employed in Cambridge. Of the 21 industrial plants in the Cambridge area, 11 are plastics plants, furnishing 26 percent of the total employment, and 31 percent of the average monthly payroll.

You will also notice that there are 1,400 now unemployed; and if we are not given immediate relief, it will add several hundred more to that number.

Also, I would like to point out that we have, wherever possible, quoted on defense jobs. The total volume of Government business we have quoted is $1,512,923.41; of which we have only obtained $7,645.50.

I think that points up the high lights.

(The statement of Eli F. Jensen and Clifton R. Downs reads in full as follows:)

We are custom molders of thermosetting and thermoplastic materials, with sales engineers and offices in Cincinnati, Ohio; Chicago, Ill.; Detroit, Mich.; New York City, and most recently, Washington, D. C. We produce molded plastic parts mainly for refrigerators, air conditioning, fans, kitchen utensils, and we also do some work for the automotive industry. Some of our principal customers are Crosley Division of Avco Manufacturing Corp., Admiral Corp., Gibson Refrigerator Co., Servel, Inc., Nash-Kelvinator, and Westinghouse Electric Corp.

Using our fiscal year May 1, 1946, to April 30, 1947, as a comparative basis, sales for the fiscal year May 1, 1947, to April 30, 1948, increased by 92 percent. For the fiscal year May 1, 1948, to April 30, 1949, sales increased by 535 percent over the base period. And for the year May 1, 1949, to April 30, 1950, by 1,529 percent.

We have $558,358.07 invested in our plant and equipment.

A total of 108 employees are working which can be classified as follows:

Officers	4
Engineering staff	6
Clerical and office	11
Supervision	11
Truck drivers	5
Laborers	4
Machine operators	67
Total	108

Our manufacturing plants have 23,000 square feet of floor space, and we have 55,000 square feet of storage capacity. Our plant is equipped with the newest and some of the largest equipment of its kind in the industry. We have injection molding machines with capacities from 8 to 60 ounces. We operate our own fleet of semitractor trailer trucks to expedite the delivery of molded parts to our customers.

In addition to this, we use the entire facilities of five other plants in Cambridge for such work as compression molding, painting plastic parts, assembling plastic refrigerator parts, fabricating fiber glass, and construction and repair of molds. These plants have a combined total of 28,700 square feet for floor space, employ 120 people, and have a capital investment of $77,100.

In order to maintain our present organization, it will be necessary that we continue to receive the same quantity of polystyrene material that we did in November 1950. From the month of November 1950, to the month of January 1951 our raw-material allocation has been reduced 45 percent, and indications are that it is not going to improve.

If our allocation is not increased, we will, of course, be forced to lay off many of our key personnel. We are reluctant to do this, because we doubt if they would be available for rehire when and if jobs are obtained in connection with the defense effort. The plastics industry has grown so rapidly that experienced people are at a premium. If we are forced into lay-offs and had to rehire at a later date, it would mean that serious handicaps would be encountered until proper training could be given. Even though our company was not in existence during the last war, our management and engineering staff were all key personnel in other plastics companies engaged in vital defense work.

Cambridge Molded Plastics and its subsidiaries are not the only ones involved. For at least the past 2 years we have been directly responsible for the employment of 35 experienced, fully qualified tool and die makers in our area, who earn salaries of from $6,000 to $8,000 per year. Like everyone else, they are looking for job security. These skilled men are vitally essential to the well-being of our business, and it appears reasonable to believe that in the event of lay-offs in the tool shops where plastics molds are constructed, they would be promptly absorbed by automotive or other industry. This would leave us hardly any hope of obtaining them again should we go all-out for defense in the future.

Without plastic material available to make various component parts of a refrigerator, and no time or material to develop substitutes, production of refrigerators will come to a definite halt. This fact has created great alarm and has brought about a violent reaction from the refrigerator industry.

Mr. R. J. Saxton, purchasing agent of Crosley in Richmond, Ind., has written to us:

"* * * curtailment of shipments from your plastic material suppliers came overnight, and there is not sufficient time to develop substitutes. If we are unable to procure plastic parts necessary to keep our line running, it will mean unemployment for approximately 4,000 people. If this situation cannot be improved, we will be unable to manufacture refrigerators, because we do not have storage space for models that are not complete with all plastic parts. It will cause a complete and definite hold-up with all of our sources on all components that go to make up a complete refrigerator."

Mr. L. H. D. Baker, vice president of the Appliance Division of Admiral Corp., in reference to their reduced production states:

"It is going to dislocate a lot of employees who are dependent on us for their weekly wage. One thousand five hundred to two thousand people would be affected and as yet no war contracts are in sight to provide them with other means of livelihood. Certainly, we don't like to lose labor, or lose control of labor, as it is highly skilled and will be of immeasurable value when the time comes that we do need to produce war material."

The population of the city of Cambridge is 14,693. A survey made last week by the Cambridge Chamber of Commerce discloses that there are 3,263 people employed in Cambridge. Of the 21 industrial plants in the Cambridge area, 11 are plastics plants, furnishing 26 percent of the total employment, and 31 percent of the average monthly payroll. According to our local employment bureau, there are 1,400 people now unemployed. If we are not given immediate relief to keep our plants in operation, we will add several hundred more to the list of the already unemployed.

We received our first invitation to bid on a defense job in May 1950. Since then, all leads for defense work have been followed very carefully, and we have contacted many Government agencies, offering our services and equipment for necessary war items. To date we have quoted prices on 44 various plastic defense items to both prime contractors and direct Government agencies. Some of the Government agencies are as follows:

1. Picatinny Arsenal, Dover, N. J.
2. Chicago Procurement Office, Chicago, Ill.
3. Department of the Army, Washington, D. C.
4. Portsmouth Naval Shipyard, Portsmouth, N. H.
5. United States Navy Purchasing Office, Washington, D. C.
6. Headquarters, Air Matériel Command, Dayton, Ohio.

The total volume of Government business that we have quoted amounts to $1,512,923.41, of which we have obtained $7,645.50.

Unless more material is obtainable, we will be in serious difficulty meeting our monthly obligation to indebtedness.

We therefore ask that you give serious consideration to this grave problem that confronts Cambridge Molded Plastics Co. and our community.

The CHAIRMAN. Thank you very much, Mr. Jensen. Now, if you will stay up here, we will ask you some questions just a little later.

Senator THYE. Mr. Jensen, there is one thing I would like to ask. When you put in the larger machines, do those machines replace the small ones, or do you use the small ones for certain types of work?

Mr. JENSEN. We use the small ones. We just add to our equipment.

Senator THYE. Thank you, sir.

The CHAIRMAN. Now, Mr. Galloway, representing the Minnesota Plastics Corp.

Mr. Galloway, we will put your statement in the record in full. Will you summarize it, or highlight it, or make any comments that you wish to make?

STATEMENT OF H. R. GALLOWAY, PRESIDENT, MINNESOTA PLASTICS CORP., ST. PAUL, MINN.

Mr. GALLOWAY. I think maybe a little bit more emphasis might be put on the number of industries that are dependent on the plastics industry. In other words, if you shut down the plastics industry for

lack of material, you shut down considerably more than that. I have given a few which are interesting. I might mention several very briefly. The manufacturer of cameras, whose cases are polystyrene. Without the polystyrene case for the camera, he can't make a very good camera.

The refrigerator parts were covered earlier. The shortage of refrigerator parts of plastic is equally serious with a shortage of steel or anything else.

We have, incidentally, shut down refrigerator plants before because of shortage of material. It immediately places thousands and thousands of people out of work when plastic parts are unavailable.

There is also another slant. A lot of parts have gone into plastic; and the parts went into plastic in an orderly fashion. I mention one company in Minnesota which has converted a large part of its Scotch tape production to a plastic core from paper spools. When you get to the end of Scotch tape, there are 6 inches of paper at the end which you cannot use; and it always makes you a little bit mad. They cannot convert back to paper in a hurry. The change has taken place over several years, and the change back to paper would be rather difficult to do. The equipment with which they handled paper no longer exists.

We have covered other uses of plastics and shown where our shortage would affect other companies.

There is one other slant I would like to point out. In the last war, our production was needed. We ended up with about 90 to 95 percent direct war work. So far, we have not more than 5 percent of our total volume in war work. But if we do run out of plastics before we find war work, we are not going to be in very good shape to turn out war items. We need a crew that knows how to handle plastics. You don't find that crew; you break them in over a long period of time. So if there is a gap in there between war plastics and civilian plastics, it is going to be very difficult to handle.

I think that covers my story.

(The prepared statement submitted by Mr. Galloway reads in full as follows:)

It is not my position to know the exact extent of the shortage of thermoplastic materials nationally. Hence, I will make no attempt to prove that the supply may be 50 percent short, nor even 30 percent short. Nor do we in Minnesota claim to understand enough of the complexities of the international supply program to even attempt to offer suggestions on how to cure or remedy the shortage of thermoplastics. We know that various plastics such as polystyrene use the same basic materials or chemicals as GR–S rubber, and that there is a shortage of rubber. Also that there are many other factors that enter into the picture. Beyond that, there are other people in much better position to work this part of the shortage into shape.

Out our way, we have seen manufacturing develop in a territory that was basically one of farming and distribution, and grow to sizable proportions. The thermoplastics short supply problem affects not only those of us who are in the plastics business itself, but also a large number of other manufacturing concerns in the area.

The majority of the thermoplastics produced in Minnesota is of custom nature, or job work. In most instances of job work, we, or our competitors, are sole source of supply for our customers. The part that we make is often part of a composite assembly, and without the plastic part the assembly is incomplete and unusable. Customers seldom have alternate molds or dies for alternate materials available for the plastic part that we supply.

There is a camera manufacturer whose camera case is made of polystyrene plastic. The plastic material has made a very satisfactory case, and this manu-

facturer has been entirely contented with it. The result is that he is not in position to use anything but the same identical polystyrene camera case that he has been using. Without this case he simply can't make cameras.

There is a manufacturer of Scotch tape who, over the last several years, jointly with our own concern, has spent a great deal of time, money, and effort, switching the many, many millions of spools or cores on which the Scotch tape is wound, from paper to polystyrene plastic because the plastic did a better job. In excess of half a million dollars has undoubtedly gone into the program. This plastics customer has revamped and changed his processing machinery so that he can gain from the close tolerances which are possible with plastic spools, as contrasted to cardboard or paper spools. To change back to paper or cardboard spools would be very difficult, wasteful, and expensive. The change to plastic was made gradually, without much dislocation. The change back to cardboard presumably might have to be made very rapidly because of nonavailability of plastic. The quantities involved would make the change an extremely rough one to handle.

This same customer has, during the year, been switching additional small hand dispensers from sheet metal to plastics, in part because it was most people's opinion that plastics would be less short in a critical material situation. Tools have been completed for this new dispenser for Scotch tape, and the piece is in production.

Scotch tape, while it carries few DO numbers, is extremely handy not only in the household, but in business offices from coast to coast, as well as in various engineering offices. Manufacturing uses also exist for Scotch tape. In the last war a surprisingly large percentage of Scotch tape went directly to the Government, and to the Armed Forces.

There is another manufacturer, much smaller than the one who makes Scotch tape, whose entire business is built around the manufacture of a sick-room steamer, such as you use when you have a bad head or chest cold. A functional part of his unit is made of polystyrene plastic. As far as we can see, without that functional part he is out of business.

Three large refrigerator manufacturing plants are in our area. There are functional parts, functional plastic parts of polystyrene material in every refrigerator turned out at these plants. Supports for shelves, thermostat knobs, door shelves for eggs, and so forth, door opening breaker strips, drawers for vegetables, handles, light switch parts, and others are typical. We know from first-hand and embarrassing experiences that failure to supply these polystyrene parts means an immediate shut-down of a complete factory and the lay-off of as many as a thousand or more people. While the parts might in time be shifted to other critical materials, the conversion would waste much money, time, and material, and in the interim there would be a shut-down. There is a manufacturer of radios for hospital patients. The housing of this radio is of polystyrene. A quick shift to another material is not possible, either in plastics or into other materials. Without the housing—no radio manufacturing business.

Each year quite a few millions of vent and filler caps for automotive batteries are produced in the Twin Cities. These caps are made of polystyrene plastic because of cost, and because of advantageous physical properties of polystyrene, such as imperviousness to battery acid. There is an alternate material for these caps—it is rubber, which is higher in price. Furthermore, tooling does not exist except in plastics, for the quantity of parts which must be produced.

Toilet seat parts are also made in Minnesota of polystyrene plastic and of cellulosic plastics. Normally these parts are ultimately used in regular housing. There have been a growing number of DO certifications accompanying more recent orders, however, for the same parts are used in defense housing, and in Army camps.

While we understand that this meeting is primarily concerned with the shortage of polystyrene plastic material, the shortage of polystyrene is somewhat aggravated by shortages of other materials which we are equipped to process, and which might be used as alternates were they readily available. Hence, a comment relative to these other materials might be in order.

A large part of the shockproof, amber-colored handles used on screwdrivers are made out our way. At the present time, comparatively few are being made on DO orders, although a few years ago practically 100 percent of the handles made were on top priority ratings.

Inadequate supplies of cellulosic plastics have very seriously curtailed our ability to manufacture screw-driver handles. The manufacturers of hand tools of this type seem to be experiencing more difficulty in obtaining quality handles, than in obtaining quality steel alloys.

As far as we can determine, there doesn't exist a noncritical plastic material that we can process.

In Minnesota there are active molds for probably 500 or more polystyrene parts. Shortage of any of these parts will yield a hardship similar to those which we have covered. Without the plastic part, the customer who uses it must either give up the manufacture of a product, and in all probability lay off his crew and hole up for a long winter, or he must scramble around desperately, often futiley, retooling, looking for new sources of supply, and often, in the final analysis when all else has been worked out, he may find that he has gone from critical plastic to a material even more critical. Personally, I am not sure how much more critical materials can get.

While welfare of the injection molding industry thus affects many more people than those employed in the industry itself, there are, however, in Minnesota alone approximately 500 people employed in injection molding plants. The capital investment in molding machines, tool-room facilities, and in molds we would guess at 3 or 4 million dollars, or close to $100,000 per employee.

In the last war, our own plant ended up more than 90 percent in direct war work, mostly on subcontract. We were able to shift into war work with practically no loss of time. We made aircraft parts and fuze parts. Within 2 weeks after VJ-day we were wheeling strong again on civilian work. Six months later, we were 30 percent back on war work, making a part required for the storage of aircraft engines. At the end of this, in a change requiring less than a day's work, we again went back to full civilian production.

Our success in the plastics field is largely dependent upon the know-how of our crew. To be able to run, we need an experienced crew, which we have now, and which we must keep.

Our company is actively looking for war work, for the last thing we want is to shut down, and then try to round up a new crew and start from scratch once more. In the plastics industry, in Minnesota, one usually is not able to hire experienced people. Most of our employees have learned the plastics business in our plant over the past 7 to 10 years. If we lay these employees off for much of a period, they will end up as some other company's employees, not ours. Thus we need thermoplastics, such as polystyrene.

The CHAIRMAN. Thank you, Mr. Galloway. If you will just move back and stay with us, we will ask you some questions in a few minutes.

Mr. Luster, of the Lincoln Plastics Corp.

STATEMENT OF CARL J. LUSTER, PRESIDENT, LINCOLN PLASTICS CORP., CAMBRIDGE, OHIO

Mr. LUSTER. Gentlemen, I will summarize my statement.

The CHAIRMAN. If you will; and your statement will be printed in the record in full.

Mr. LUSTER. Thank you.

To refer to the first paragraph, you will note that our expansion has been pretty much typical of most molding companies in the injection molding industry.

The second paragraph refers to the products that we manufacture, three main products: Plastic wall tile, housewares, and molded parts for the refrigeration industry.

One thing I might mention is the fact that the refrigerator industry uses around an average of 17 pounds of polystyrene molding powder in each refrigerator; and it would be very unlikely and difficult for them to convert over to other materials, should we shut them off, due to lack of molding powder.

In paragraph A, on the second page of my talk, you will note that we have been cut back in our supply of material. We are now receiving only 44.4 percent of material that we received in October of 1950. By the end of February, we will have used up our inventories, and will

have to stop production unless we obtain more material. This is a question of time, as far as we are concerned. If we do not get relief shortly, why, we won't be in operation.

On the third page, in the third paragraph, I refer to the amount of capital invested in our two plants. I also mentioned the combined payrolls of the two plants, approximately $450,000 a year.

In the fourth paragraph, on page 3, I refer to the number of employees, 141, that we have on our staff. We have a manufacturing plant area of 26,000 square feet; and storage capacity of 40,000 square feet.

On page 4, I refer to the amount of lay-offs that have already occurred in our plant. In the first 2 weeks in January, we laid off 5 percent of our workers. By January 30, we will lay off an additional 10 percent of our workers. When I wrote this talk, I anticipated laying off 10 percent of our personnel by January 30; but, as a matter of fact on Saturday, I had to lay those 10 percent off.

Senator HENDRICKSON. Is that because of shortage of materials?

Mr. LUSTER. Yes, sir.

Senator HENDRICKSON. Solely?

Mr. LUSTER. Yes, sir; entirely. On the fourth page, in paragraph A, I refer to the fact that we request relief so we can obtain more material.

On page 5, I have given a brief summary of what we have done in an effort to obtain defense orders. It is rather complete, and you will see that we have certainly been very active since Korea in an effort to get some Government work. We are on file, and listed with some 200 Government agencies to receive their bids, but have only obtained approximately $2,000 of defense contracts to date.

I ask for temporary relief to be granted, as outlined in this report, as presented to Dr. Steelman, for the plastics injection molders. I refer to this report which we turned over to Dr. Steelman on Monday of this week, which I would like to include for your consideration.

The CHAIRMAN. That will be included in the presentation.

Senator THYE. Mr. Chairman, might I ask a question there?

The CHAIRMAN. Yes, sir.

Senator THYE. Are there any processors who are getting contracts in the United States? Do you know whether plastics, in general, are getting war contracts?

Mr. LUSTER. Very few.

Senator THYE. Is it general over the Nation that you are not getting the supplies of materials?

Mr. LUSTER. I would say that it is general over the Nation. There are very few plastic molders getting defense contracts today. A very minute percentage of the total sales are those of moldings, ordinarily.

Senator THYE. Thank you.

Mr. LUSTER. I would like to add one more comment, Senator Sparkman.

The CHAIRMAN. Yes, sir.

Mr. LUSTER. This is referring to the problem and how we can obtain relief. I would like to submit a report of the society of the Plastics Industry that we prepared. Here is the chart which I hold up for you here, showing the growth and use of polystyrene molding powders. This black line would have been the trend or is the trend

of the use of polystyrene. Our present cut-backs in polystyrene, due to the fact that the rubber industry is taking the monomer from us for synthetic rubber, will reduce our sales level down to this line here, as forecast. This would have been the trend had we been able to continue as we were before the program was reallocated [indicating on chart]. We are asking for relief, for reduction in the timetable of synthetic rubber, which would give us material to meet this sales level [indicating chart], which would be below our trend of sales, but, nevertheless, would probably permit most of us molders to exist during this period of semimobilization until sufficient war work is available or some other means are arrived at to give us relief.

The CHAIRMAN. Thank you very much, Mr. Luster. We will be very glad to have any part of that that you may wish to submit for the files of the committee, or for the record, such parts of it that may be placed in it.

Mr. LUSTER. I would like to refer it all. Thank you.

(The prepared statement of Mr. Luster reads in full as follows:)

I am testifying on behalf of Lincoln Plastics Corp. and Plastics Corp. of America, a wholly owned subsidiary. For simplicity I will refer to both corporations as Lincoln Plastics.

I. Taking as a base our fiscal year from August 1 to July 31, 1947, our sales increased 50 percent in 1948, 125 percent in 1949 and 600 percent in 1950. Our estimated sales for 1951, prior to the impact of material shortages, would have increased 900 percent over our base year. From a beginning, with three injection machines, we now have a total of 16 machines, some of them the largest of their kind in the industry. It was our intention to put at least one more plant in operation in 1951. In July of last year we took an option to purchase eight additional injuction machines. We canceled our purchase order early in December, having come to the conclusion that there would be no material avaliable for these machines.

II. Plastic wall tile, representing approximately 50 percent of our sales, is sold and advertised nationally through radio, television, newspapers, and magazines. Ninety percent of the use of wall tile is for remodeling existing structures and converting single dwelling units into multiple dwelling units.

The second type of product we manufacture is the custom molding of refrigerator parts for the major refrigerator companies. These parts we manufacture are for original refrigerator equipment and are a direct component used in the assembly of refrigerators. The refrigerator companies today have come to depend so greatly on polystyrene molding parts that they use somewhere around an average of 17 pounds of polystyrene molding powder in each refrigerator. In the case of one manufacturer, as high as 20 pounds. It is extremely doubtful that the refrigerator companies could replace 20 pounds of complicated plastic part components in the assembly of their refrigerators should we be forced to shut them down due to lack of raw material.

We also manufacture housewares for the chain stores. This field represents only 12 percent of our sales.

A. We have been on allocation from our material suppliers since August of 1950. We have obtained less and less material each month culminating in this month of January, during which our allocations have been reduced by 66.3 percent from one of our principal suppliers and 40 percent by our second principal supplier. These two suppliers furnish us approximately 88.6 percent of our material requirements. We have been informed that our allocations will, in all probability, continue at this drastically low rate up to June of 1951 at which time we have been told material suppliers hope to be able to give us some relief. But this is only a hope, and even with this no specific quantity has been indicated to us. In total we are now getting approximately 44.4 percent of the material per month that we had been using in October and November of last year. This is far below our break-even point. By the end of February, we will have used up our normal inventories and will have stopped production unless we obtain more material through some form of relief or are able to obtain war contracts that would carry DO ratings.

III. We have $537,993.92 of capital invested in plants and machinery and since we have expanded tremendously in the last 3½ years, a good part of this represents indebtedness owed our mortgagees. In order for us to meet our monthly mortgage

obligations, we must operate at a minimum of 75 percent of capacity. This would require approximately 70 percent more material than we are now getting.

Our combined payrolls in the two county seats in Ohio where we are located are approximately $450,000 a year. Should we be unable to obtain more material, not only would these payrolls be reduced but a far greater amount of money in payrolls would be jeopardized throughout the country through all of our customers' payrolls and activities.

All of our equipment is of the most modern and latest type available in the plastics industry. Improved molding techniques permit the manufacture of molded products with better dimensional stability, greater impact strength, and higher chemical resistance—properties that were unavailable in the last war.

IV. A total of 141 employees are working which can be classified as follows:

Officers	3	Shipping and receiving	2
Engineering staff	3	Maintenance	5
Clerical and office	13	Machine operators	77
Salesmen	1	Packers, female	22
Supervision	12		
Truck driver	1	Total	141
Laborers	2		

Our manufacturing plants have 26,000 square feet of floor space and we have 40,000 square feet of storage capacity.

The first 2 weeks in January we laid off 5 percent of our workers. By January 30 we will lay off an additional 10 percent of our workers, making a total of 15 percent layoffs through January. We will continue laying off personnel through February until we are forced to shut down the latter part of March. It will probably be necessary for us to completely shut our plant down until we can build our inventories up since we must have a certain minimum inventory of raw materials for us to operate at all economically. In the combinations that plastic tile, housewares, and refrigerator parts are manufactured, our customers must have all of the components or none, otherwise we shut them down too.

A. We are asking that through some means of relief we obtain enough material so that we can maintain our facilities and preserve them during this interim period of semimobilization so that, in the event of full mobilization, we will be able to do the important and necessary job we will be called upon to do in the period of all-out mobilization. The plastics industry is relatively a new and rapidly growing industry. There are few qualified engineers, tool makers, maintenance personnel, design engineers, et cetera. It is very difficult, if not impossible, to simply hire such men. Our experience has been that we have to train them ourselves, over a period of years, since the plastics industry is still an industry of personal know-how and highly skilled techniques, therefore, even in the event that we could still remain a business entity, we would still be unable to operate once having shut down and lost our trained engineering, supervisory, and skilled workers.

V. I would like to tell you briefly of some of the things we have done in an effort to obtain defense contracts. Since war in Korea broke out in June, we immediately started to compile the present brochure which I held before me. This brochure cost over $4,000 to prepare and 500 of these were completed by August. On July 15 we assigned our plant engineer as chief project engineer for defense. His entire efforts have been devoted to this purpose since that time. On July 20 we hired additional personnel and opened an office here in Washington as a headquarters to correlate our defense activities.

We have requested security clearance for our top engineering personnel. In August we assigned our New York sales office to the securing of defense contracts in the important New York, New Jersey, and eastern Pennsylvania areas. Last week we assigned our plant superintendent at Circleville to the full-time job of working with the Naval Ordnance Laboratory, Naval Gun Factory, Bureau of Ships, and Army Ordnance. We are opening up a Chicago office staffed with engineers and stenographers to solicit subcontract work. We have taken the above steps realizing that our future existence depends upon our ability to get Government contracts, in view of the drastic curtailment of polystyrene material for our regular business.

We have been unable to get defense contracts to date because there have been very few such contracts given to industry today and where there have been large contracts placed, the prime contractors have not as yet started full-scale production.

Since we were not in existence during the last war, we have no stand-by contracts or tools with which to revive wartime contracts. Certainly it is not because

of lack of effort on our part since we are listed and on file with over 200 Government agencies to receive their bids. We have obtained only one small defense contract involving approximately $2,000.

In conclusion, I would like to point out that because of this unprecedented material shortage facing us, we are devoting almost all of our management and engineering skills toward securing defense contracts. It takes time, however, to convert over.

I ask for temporary relief to be granted as outlined in this report presented to Dr. Steelman on behalf of the Injection Molders' Committee on National Security of the Society of the Plastics Industry, Inc.

In October of last year when the supply of polystyrene started to be curtailed drastically because of the diversion of styrene to the production of GR–S, the injection molders moved to direct their collective attention to this problem. They established an emergency committee to deal with the matter. The committee they organized was the Injection Molders' Committee on National Security. At once, the committee moved to investigate the underlying factors which were causing the shortage. It forthwith became apparent that the shortage was brought about because of the unprecedentedly large-scale production of GR–S.

Since the reactivation of the GR–S program had been undertaken by virtue of a directive the Rubber Reserve received from the Executive Office of the President, the committee felt it should proceed in suggesting a solution on how the shortage of styrene might be relieved to that branch of the Government.

Representatives of the molders' committee met with Dr. John R. Steelman to discuss the matter. At his suggestion, the committee moved to prepare a report including recommendations on how the shortage of polystyrene could be alleviated. The report, including the recommendations, was submitted to the Executive Office of the President on January 15.

The recommendations the committee made were as follows:

1. It was suggested that the styrene content of GR–S be reduced from 23 percent to less than 19 percent.

2. It was recommended that the schedule for the production of GR–S in the first half of 1951 be adjusted.

In addition, the committee recommended that the production of petroleum-based benzene be undertaken as soon as possible and that the placement of production defense business of plastic parts with injection molders should be accelerated.

A detailed copy of these recommendations is submitted to the Select Committee on Small Business of the United States Senate, herewith.

The report of the Injection Molders' Committee was filed with the Executive Office of the President on January 15. This report was acknowledged on January 16, as follows:

THE WHITE HOUSE,
Washington, January 16, 1951.

DEAR MR. CRUSE: As I indicated to you on Monday, I believe that the National Production Authority is the agency which should consider the problems of the injection molders in the information presented in your letter to Mr. Steelman on January 10. I am therefore referring your report to them for consideration. Copies are also being sent to the Office of Rubber Reserve for information and it may be that after the new Defense Production Administration is in operation, a copy of the study should also be sent there.

It is entirely possible, as I am sure you realize, that the solutions recommended in your study will not prove feasible in the light of all the various aspects of the defense program. Nevertheless, I believe that the problem of the injection molders is one which requires careful consideration, and I am sure that the officials of the National Production Authority will make every effort to assist in finding a solution.

Sincerely,

JOHN C. HOUSTON, Jr.,
Special Assistant to Mr. Steelman.

The CHAIRMAN. I would like to ask one question of you gentlemen, and it is this: All of you have told us a story of your fight for survival. I know I speak for the committee when I say that we do believe that this new, young, important industry certainly ought to be able to survive through this mobilization period; and we want to help in any way we can to bring that about.

Assuming that the defense contracts may be available, are your plants, the plants of the industry, generally capable of easy conversion to defense orders?

Mr. LUSTER. Yes, sir.

The CHAIRMAN. In other words, if the defense program is going to take away your supplies, then you hold yourselves not only in readiness but in eagerness to get defense contracts that will keep you running?

Mr. LUSTER. It might take us about 3 months to tool up and get new dies. Once the dies are built, it will be a matter of days or hours, even.

The CHAIRMAN. But conversion is not a major item?

Mr. GALLOWAY. If we have the contracts, we can go directly into war work without any change-over.

The CHAIRMAN. Senator Gillette?

Senator GILLETTE. Mr. Chairman, amplifying the question that you just asked, it is going to be essential for this industry to have defense contracts to tide them over the transition period, and the change-over.

Mr. JENSEN. Yes, sir.

Senator GILLETTE. Now, I want to ask this of Mr. Jensen: Your statement says that you received your first invitation to bid on a defense contract last May—May 1950.

Mr. JENSEN. Yes, sir.

Senator GILLETTE. And you bid on 44 requests since that time, for a total of over 1½ million dollars?

Mr. JENSEN. That is right, sir.

Senator GILLETTE. You have only received a contract for $7,645?

Mr. JENSEN. That is right.

Senator GILLETTE. Why were your bids rejected? On the price quoted?

Mr. JENSEN. No. I do not know that anybody in the industry got them.

Senator GILLETTE. But the fact remains that you bid on 44 requests for a million and a half worth of work; and you have only received a little over $7,000?

Mr. JENSEN. Right, sir.

Senator GILLETTE. That fact remains. Mr. Luster, your statement is that you have opened up offices in various parts of the country, seeking these defense contracts, a naval ordnance laboratory, naval gun factory, Bureau of Ships, and so on; and that you have received only an infinitesimal amount in the way of contracts.

Mr. LUSTER. That is right, sir.

Senator GILLETTE. You also state that some contracts have been placed with large contractors. Did you bid on those?

Mr. LUSTER. I was referring, Senator, to the type of prime contracts that would be placed, for instance, with an aircraft manufacturer, that would involve plastic components, for instance, in the assembly of the plane.

Senator GILLETTE. For additional materials?

Mr. LUSTER. That is right.

Senator GILLETTE. Or for additional commodities that are some of your products?

Mr. LUSTER. Yes, sir. Let us say, because it would take Republic Aviation 9 months to tool up on a pursuit plane, we would have to wait that period of time to get any of that.

Senator GILLETTE. Have you been bidding directly with the Government for some of the defense contracts with plastics?

Mr. LUSTER. Yes, sir; we bid directly with the Bureau of Ordnance, with the Navy.

Senator GILLETTE. You have not received anything except a very small amount?

Mr. LUSTER. No, sir. In that case, the bids were all rejected, and they were negotiated then directly by the Navy late in December.

Senator GILLETTE. Was there any regular pattern as to why they were rejected, because of the amount of the bid, or inability to fill a contract, or something of that kind?

Mr. LUSTER. That happened to be an increase in the price of raw materials at that time; and also the Navy had apparently changed their scheduling requirements for the materials. So, the two factors coupled together apparently gave them sufficient reason to justify negotiating.

Senator GILLETTE. Did they change the specification after they advertised for bids, or requested bids?

Mr. LUSTER. No, sir. The raw material which happened to be ethyl cellulose went up in price during the period the bid was opened.

Senator GILLETTE. That is all, Mr. Chairman.

The CHAIRMAN. Senator Thye?

Senator THYE. Mr. Chairman, I wonder whether the information these gentlemen have is that other materials have been contracted for by the Defense Department? In other words, instead of using plastic, they were using aluminum. Do you have any such information?

Mr. SINGER. I really don't think that they have got to the meat of letting these contracts yet, where it would involve many of us molders.

Senator THYE. Then, if they have not gotten to letting contracts, why is the material tied up in such a manner that you cannot process what we domestically need?

Mr. SINGER. Well, the synthetic-rubber program is the main reason.

Senator THYE. They have diverted all of the raw material to the synthetic rubber rather than into the plastics?

Mr. SINGER. Plus the fact that there has been a natural growth, also.

Senator THYE. When you could not get the raw materials to process, did the manufacturer then have to substitute other materials, such as aluminum, to take its place?

Mr. SINGER. Well, in many instances, they were just out. They just reduced.

Senator THYE. In other words, shut down?

Mr. SINGER. That is right.

Senator THYE. Thank you, Mr. Chairman.

The CHAIRMAN. Senator Hunt?

Senator HUNT. Mr. Chairman, I think what I had in mind was explored by Senator Thye. I was just wondering if our staff could not take one series of these bids, and trace them down, and ascertain for the committee the exact reason that the bids were not accepted.

The CHAIRMAN. I think that is a very good suggestion; and we will ask the staff to do that. I assume that, if there is a reduction in the manufacture of refrigerators, we will say, to 50 percent, you still would count on supplying the same percentage of pieces and parts to the refrigerator industry? In other words, your supply to that industry would still run at about 50 percent. You are geared up to the general civilian economy?

Mr. JENSEN. Right.

The CHAIRMAN. And you must hope to supplement the production for that by such defense orders as you may be able to get?

Mr. JENSEN. That is right.

The CHAIRMAN. Any further questions?

Mr. SINGER. I might give you the number of the bid that I think would help facilitate that investigation.

The CHAIRMAN. You are talking about the information for the staff?

Mr. SINGER. Yes.

The CHAIRMAN. Mr. Stults, will you please see all these gentlemen with reference to following these bids, according to Senator Hunt's suggestion.

Thank you very much.

Now, Mr. Blount, of the bakelite division of the Union Carbide & Carbon.

Mr. Blount, we are very glad to have you with us. We regret the need for having to hurry up the schedule; but you know what we are up against.

Mr. BLOUNT. Right.

The CHAIRMAN. Your full statement will be printed in the record.

STATEMENT OF CLINTON W. BLOUNT, BAKELITE DIVISION, UNION CARBIDE & CARBON CORP.

Mr. BLOUNT. You have my statement, and I think it is not necessary for me to prove that small business is involved.

Gentlemen, if you will excuse me, I am going to stand up and give you a little idea of the answer to some of your questions.

One question was asked about the dip in the chart, the large report. That dip is due to the fact that the synthetic-rubber program is getting along in an accelerated way; and up through May of this year will require more styrene monomer, which requires more benzol, which requires more ethylene.

Now, you asked a question concerning the conversion to war. We had experience in the phenolic molding materials, which are likewise dependent upon benzine, and which likewise go to a group of small-business men, during the last war.

In 1941, we operated at capacity. In 1942, our sales of molding materials to molders went to 60 percent of 1941.

In the case of my particular company, by 1944, we had surpassed the level of 1941, because of the war demands.

Now, let us look at a few peacetime applications.

A distributor head for an automobile. A hand set. If we start the automobile engine, we must stop it, with a brake lining.

Let's look at the wartime application:

A bomb booster tube. This tube accelerates the rate of the discharge. A 75-millimeter shell hose. A fire-control outlet box aboard ship.

Gentlemen, having had personal experience with most of these items, I know the engineering of them took many months, and, in some cases, years.

One of the larger users of polystyrene which was referred to by the other gentlemen is an aircraft battery case.

Here is a piece of refrigerator insulation, such as is on your electric ice box. That is for peace.

For war—Navy insulation board. Two years' development work it took, in converting that. Every submarine and every bulkhead is lined with that type of product.

Peace—dishes.

Wartime—aircraft ignition.

I can assure you it took an entirely new molding technique, and approximately 2 years in conversion.

For health, which was mentioned, here is a development really coming out of the last war. At the Navy Amputation Center, they originated a new method of making an artificial limb. This is a phenolic type of resin, used as a corrective for a brace. You can see the lightness of it in weight. It is for a child with infantile paralysis. We are allocating that in full.

This is a type of artificial leg. The stump goes in here [illustrating]. We are allocating that in full.

This is a type of mess kit knife used in the last war. The development of that took about 18 months.

Here is a T–44 frangible bullet, made of material that people thought was for gadgets in the last war.

Here is an interesting thing. Here is a plane taken from the observation tower on the coast of France by the Navy Seabees, which was given to me. It was made by the Germans, of German polystyrene, so they could recognize our aircraft.

Now, gentlemen, in the case of shells, here is a material using also the phenol resin, which goes into the molded telephone, the hand grenade, which makes possible the use of steel for shell case instead of brass.

Now, getting back for a moment to the styrene material they are talking about, we were one of the few plants, prewar, that were producing styrene in a pilot plant. Our sale of it, we will say, was 1.0 in 1941; 1.18 in 1942. This material is half the weight of glass. If you consider flying it by the ton-mile, and its lack of fragility, you can get some idea of what the possible engineering applications are.

I can assure you, gentlemen, from my personal contacts, many of the arsenals and laboratories are working with these new materials. It is possible that this product could be needed in much larger quantities than we ever dreamed of in making incendiary bombs.

Thank you, gentlemen.

The CHAIRMAN. Thank you.

(The statement of Mr. Blount reads in full as follows:)

I represent the bakelite division of Union Carbide & Carbon Corp., a producer of plastic raw materials used by every industry when fabricated into finished articles ranging from babies' wet-proof pants to snagging wheels for removing burrs from large steel castings.

The principal materials we produce, our tools of trade, are:

1. Phenolic molding materials, resins, and solutions.
2. Vinyl resins, compounds, films, and sheeting.
3. Polyethylene resins and compounds.
4. Polystyrene molding materials, emulsions, and coating resins.
5. Urea resins and blues.

The purpose of my appearing here before you is to demonstrate:

1. The essentiality of the plastics industry to war and civilian economy.

2. That small business concerns in the main are customers of the raw-material producers and their well-being a matter of concern to the Select Committee on Small Business.

3. To respectfully solicit your consideration and assistance in keeping many fabricators of plastic materials solvent financially.

The national security of our country must come first but an unnecessary dislocation may adversely affect our ability to produce vitally needed war goods at a later date.

An engineer in dealing with a subject must consider information and catalog it as (1) facts, (2) opinion, (3) hearsay.

For example:

1. It is a fact that I am present here today.

2. It is my opinion that no industry alone is all-important to the welfare of the United States. Steel, copper, glass, rubber, aluminum, et cetera, and plastics are each interdependent upon the other.

3. It is hearsay that most people think of plastics as an industry producing largely knickknacks and gadgets.

Maybe I am presumptuous, but I dare to challenge anyone to name an industry that plastics in some way does not serve well.

For example, let us imagine for a moment that all plastic parts in the world disintegrated and became useless, then the following would happen:

1. All farm tractors would cease functioning. The insulation on their ignition system is a phenolic plastic. The covering on their wires is probably a vinyl plastic.

2. All electric power would cease. Insulation on switches, circuit breakers, wiring devices, and countless items, is plastic. Even the adhesive bonding the glass bulb to the screw base of an electric lamp is plastic.

3. All planes would be grounded. The control panel, the pulleys over which control wires pass, the ignition insulation, the very tips of safety belts, are plastics.

4. Our battleships, destroyers, tanks, motorcars, elevators, trains, trolley cars, busses, telephones, and countless other facilities would cease to function.

Thus, gentlemen, we can but conclude that the plastics industry is essential to the civilian and war economy of the United States.

As a producer of plastic materials, it was our privilege to serve during the year 1950 some 4,500 customers. Seventy percent, 3,150, have a net worth of under $500,000, and 30 percent, 1,350, have a net worth of under $250,000. Purchases per customer range from 50 pounds to over a million pounds per calendar quarter.

Not all customers purchase in a given month. During December 1950 we sold, allocated, and delivered materials to 2,110 valued customers; 1,768 or 84 percent of these customers have a net worth of less than $1,000,000; 342, or 16 percent have a net worth of over $1,000,000. Thirty percent of dollars billed went to the group with less than a million dollars net worth compared to 70 percent to customers having over a million dollars net worth.

It is hearsay that a small-business concern is one with a net worth of less than $1,000,000. Then we must conclude that 84 percent of the customers of Bakelite purchasing 30 percent of its volume in dollars in the month of December are a matter of concern to this committee. It is my opinion that competitive suppliers have a similar pattern.

After the word "sold," appeared the word "allocated." According to "hearsay" by telephone, telegraph, and letter not one of the valued customers is receiving sufficient materials for his needs.

Allocation of materials is a complicated problem. If allocation were carried out by personal whim or selection, industry might be sorely crippled. For example, if television cabinets were allocated a preferred position, sufficient resistors and capacitors would not be available to produce the chassis for such set and vice versa.

I have been asked to advise you gentlemen of our method of allocation. In the main, the percentage of a class of material purchased by a given customer during the 18 months ending June 30, 1950, is the percentage of the total output

of that class of material allocated to a given customer in a given month. Exceptions are contract customers who contracted in advance of their materials. D. O.'s are served first in full but in the main D. O.'s do not assure to a customer more material than the contract quantity or allocation rate. Neither D. O.'s nor allocation produce more materials.

While all materials produced by my company are short in supply, I shall deal only with those produced from benzol (benzene) at this time. These are popularly known as polystyrene and phenolics. I solicit the help of you gentlemen in retaining sufficient benzol to keep solvent financially small plastic fabricators of both polystyrene and phenolic materials. Polystyrene is the newest and others have and will talk to you today concerning it. It is my opinion that its lightness in weight and fabrication with relatively little manpower will make it increasingly important in all-out war effort.

For example, this 12-ounce tumbler weighs less than one-half as much as a similar glass tumbler. Consider transporting these by air to a far away base at so much per ton-mile. This is a special styrene copolymer which may have considerable use in incendiary bombs since it is resistant to gasoline. If such is the case after long tedious tests, should we not insure fabrication facilities that can produce them remaining in working order. It is my belief that this can be done by insuring continued financial solvency of the present fabricators. The tumbler shown was produced by the Plastic Manufacturing Co. of Dallas, Tex., a small concern.

Consider phenolics in serving industry since 1909.

At the start of World War II some in this room heard a general say in substance, "These materials will not be used in a war, they are for gadgets." Let us take a look at the record of the sales of bakelite.

Phenolic molding materials: 76.3 percent of the customers for these products have a net worth of less than $1,000,000.

1941—12 months largest delivery in history up to that time (rate per month)	1. 0
1945—First 6 months, war peak (rate per month)	1. 28
1950—First 6 months	1. 24
1950—Third quarter (after Korea)	1. 58
1950—Fourth quarter (raw material cut-back due largely to benzol)	1. 29

Peacetime uses are such as these: Telephone handsets, automobile distributor heads, rayon machinery parts, radio and television parts.

Wartime uses are such as these: Frangible T–44 bullets, clothing buttons, bomb booster tubes, Navy fire-control outlet box.

Phenolic laminating varnishes: Fifty-eight percent of the customers for these products have a net worth of less than $1,000,000.

1941—12 months average	1. 00
1943—War peak yearly average per month	1. 51
1950—First six months (pre-Korea)	1. 46
Last six months [1]	1. 40

[1] Use of metapara cresol and cresylic acid, not dependent on benzol, in making these products show up better than on molding material.

Peacetime uses are such as these: Decorative table tops and wall covering, silent gears, electrical insulation of all types.

Wartime uses are such as these: Aircraft pulleys; electrical insulation of all types for planes, tanks, and trucks; parts of the proximity fuze; tubing for bomb boosters; ammunition chutes for aircraft.

Phenolic bonding resins: 65.4 percent of the customers of these products have a net worth of less than $1,000,000.

1941—12 months monthly average	1. 0
1944—War peak, 12 months average	1. 34
1950—First 6 months (pre-Korea)	1. 36
1950—Third quarter	1. 28
1950—Fourth quarter	1. 24

Typical peacetime uses are such as these: Grinding-wheel bonds cut-off and snagging, brake lining for autos and trucks, rock and glass wool bonds for heat insulation.

Typical wartime uses are such as these: Grinding-wheel bonds, brake lining for aircraft and combat vehicles, heat insulation such as navy board.

Coatings:

1941—12 months average	1.0
1943—Monthly average war peak	1.84
1950—First 6 months (pre-Korea)	1.55
1950—Third quarter	1.70
1950—Fourth quarter	1.66
November and December	1.40

Typical peacetime uses are: Primer for dam locks, bridges; spar varnishes for ships; chemical resistant enamels.

Typical war uses are: Navy specification varnishes, aircraft primers.

We believe the above figures demonstrate that a material thought of as a gadget material at the start of World War II in every branch of its business was required in greater quantities during the peak of mobilization than before the war. It is my opinion that the needs for these materials will be even greater in the next war since they are better known. It is my further opinion that the materials known as polystyrene which were not available in other than pilot plant quantities prior to World War II will, because of exceptional qualities, be equally in demand in an all-out armament program. The reason for this is the lightness in weight, being only slightly heavier than water and one-eighth the weight of brass, plus their ease of fabrication into difficult shapes on semiautomatic machines requiring little manpower.

It is interesting to note that in 1941 the monthly average sales from our pilot plant for polystyrene was represented as a unit of 1.0. During the first 6 months of 1944, the war peak, the monthly average was 1.18. We operate our pilot plant at capacity. Security prevents my disclosing the principal war uses of the styrene produced by my company during World War II.

In conclusion, I recommend:

1. That action to increase the availability of benzol in the United States be taken as rapidly as possible. Such a program is under way at NPA, and a Benzol Advisory Committee representative of all raw material suppliers to this group has studied the problem and rendered a report.

2. That this Senate Committee on Small Business use its influence to expedite action. This may involve fixing authority for action so there is no doubt as to responsibility.

3. That no industry or part of an industry be given a select position in raw materials until an unbiased person or persons has had an opportunity to study the effect on the economy as a whole.

It is my opinion, perhaps from a selfish point of view, that certain programs having preference at the present time might be delayed by a small percentage and enable the concerns fabricating materials based upon benzol to remain solvent financially. This would make them available for war production at a later date.

The CHAIRMAN. Now, is Mr. Nalle up here too?

STATEMENT OF GEORGE S. NALLE, JR., PRESIDENT, NALLE PLASTICS, INC., AUSTIN, TEX.

Mr. NALLE. Distinguished Senators, it is an honor and privilege to be here with you today. This is my third trip to Washington since the Korean War started, in a frustrating attempt to get Government contracts.

My company was organized by my father and myself upon our liberation from the armed services. Within 24 hours after getting out, I had bought my first injection molding machine. We started with an initial investment of $50,000. We now have a completely paid-for equipment and plant worth $150,000. It has been an up-hill grade all the way, I assure you. We finally learned how to sell; and since then, things have been going very well. But during those first years, it was definitely a touch-and-go proposition.

Now, in this, the beginning of our fifth year, we no longer face problems. We face total and absolute annihilation.

I was in Russia back in 1935; and the Russians had a very polite little word for getting rid of things, and people in particular. They called it liquidation. If we cannot get at least 30,000 pounds of material per month, we are going to be liquidated. About 9,000 pounds is all I am getting this month.

Our company differs a little bit from the financial picture which you have heard, in that we are in an extremely sound financial condition. I hope that is not going to be held against us by the materials manufacturers, and have them cut down our supply just because we might be in a little bit better position. We are currently discounting all our bills; and we shall continue to do that; but if we cannot get material, we are going to be completely liquidated.

I would like for you to have a little sample of one of our peacetime products, and one of these booklets, that is devoted to a few of the things which we have in our plant. On the back of it there is a picture of the strategic bombing triangle, where I believe the danger zone lies, and I would like to urge you to assist us in getting some business out of this strategic area and into the area which is less dangerous from the standpoint of bombing.

Now, I am not the only one in Texas in this position. Take my friend, Lou Barnett. He is in about the same position. Mr. Barnett has had broad experience in plastics, and organized his own company in 1947. Mr. Barnett states that he employs from 50 to 90 people, with an investment of $200,000. Seventy-six thousand pounds per month of material is his break-even point; and he especially asked me to urge you to consider getting some contracts out of the central danger area, from the standpoint of bombing.

Another gentleman who is also having trouble is Mr. Joe Moore. His position is difficult, at best, because he started in the plastics industry with very little previous experience, and no technical education. Yet, he is about to be struck out before he has even had a chance to get started.

We realize that monomeric styrene has been channeled into the rubber industry, but we have not seen a single cut-back in civilian rubber.

Now, this rubber program is important; but all we are asking is a fair division of available supplies with the rubber people, in order that we may survive, to go into the war work, for which we are definitely fitted.

The little product that we passed around is a civilian application; but we are equally prepared, in my small company, to go into full and all-out war production. Not only are we equally prepared; we are eager to do it. When I was here in September, no one had heard about this war. When I came back in November, the situation was not much better. I, personally, visited the St. Louis ordnance district, Wright Field, the Picatinny Arsenal, Edgewood Chemical Center; and all those procurement people in the District of Columbia. I neglected my civilian business, preparing bids, getting bid bonds, cutting the red tape, with no success whatsoever.

We have now employed a Washington representative on a part-time basis; but what chance does a part-time representative have against a tremendous company which maintains big lobbies?

War throws the good contracts to the big ones; and at the end of the war they end up bigger. The independent manufacturers get their throats cut. We win the war on the battlefront, and lose the war on the homefront, because the small manufacturer has been squeezed out. Make no mistake about it, gentlemen, I think that this is happening right today.

Why, gentlemen, the rubber industry which is running at full blast, when asked by the Quartermaster for bids on tires, always submit the same figures? That is because they have squeezed out in their business that healthy little nucleus, or healthy assemblage of small manufacturers.

For the past 5 months, I followed every legitimate lead on getting Government contracts.

Senator GILLETTE. With what success?

Mr. NALLE. With no success whatsoever, sir. I cannot get this war work, apparently, on my own hook. Maybe it is because the war contracts haven't been started yet. Maybe it is because we have been a little high in some cases. But I think it is mostly because we are not in the right place at the right time to get it.

It is very difficult in Texas to be up here and make contacts and be on the ground all the time. That is why I took on this part-time man.

There are only two requests I have to make of you: Help us get enough styrene to stay in business until such time as we can get war contracts.

Gentlemen, thank you very much.

The CHAIRMAN. Thank you, Mr. Nalle.

Now, Mr. Sholkin, of the Beacon Plastics.

STATEMENT OF JOSEPH L. SHOLKIN, PRESIDENT, BEACON PLASTICS CORP, NEWTON HIGHLANDS, MASS.

Mr. SHOLKIN. Government allocations can be just as deadly as bombs. In the city of Leominster, Mass., population 23,000, 85 percent of the payroll comes from plastics industry. During the last war, Leominster was approximately 75 percent converted to the defense program. This city does not have to be blitzed by enemy aircraft—it can become a ghost town simply through a lack of plastic powder.

The same holds true of the plastics industry and my firm, the Beacon Plastics Corp., which has been in business for almost half a century, affords an excellent case in point. The growth of the plastics industry has been so dynamic since the war that you cannot remain static. You either adapt to the rapid advances in techniques and equipment, or lose out to competition. In 1946 we purchased a building of 6,500 square feet. Last February our most recently completed addition gave us a total of 40,000 square feet, an increase of 600 percent. Plans and contracts for a further addition were canceled last summer as a result of the styrene shortage.

In 1946, we employed only 50 or 60 people, and this number has been increased more than 300 percent since then, although now the shortage of powder is causing a reduction.

Our molding and manufacturing equipment has an expanded capacity of almost 600 percent since 1946. Each molding machine the

size we now use is worth about $25,000 new. Last February alone we installed three machines. Molds necessary to produce the various items often cost $5,000 each, and we have purchased almost 50 molds since 1946. Building construction is also very expensive, and there are many other substantial elements of cost. Our utility installations are worth more than $20,000.

This expansion program was accomplished in a post-war period of competitive selling without swollen war profits, Government subsidies, or quick write-offs. It was done with personal sacrifice, reinvestment of profits, and the usual bank financing. We have just begun to amortize this tremendous long-range investment and even a slight reduction in the supply of powder poses a serious problem. A sustained cutback can be ruinous. Just try to pay a bank one-quarter of the amount due them because you can only get one-quarter of the amount of raw material you require.

These problems are not personal or selfish. They exemplify a situation that confronts so very many other small firms who have invested almost their entire net worth in bricks, mortar, machinery, and molds to make plastics one of the fastest growing industries in the country since the war. It also affects many loyal workers who are dependent upon us for their income to meet the obligations they have incurred such as home mortgage payments as well as everyday living costs.

In the long run, the Government itself suffers; for if our national economy is disrupted, we fall prey to Kremlin strategy. More important, however, is the fact that the Armed Forces will be deprived of the rich military potential of the plastics industry which has such unique facilities for quickly mass producing identical parts.

Like so many other plastic firms, we have for months contacted countless agencies of the Government and armed services. Our files are literally bulging with correspondence, reports, and forms. We have a complete library of booklets telling us "how to do business with the Army, Navy, Air Forces, and Government," but one important volume is missing—"How to Get it." Last August, the local ordnance office made a preliminary survey of our plant. A planning cognizance was to be requested from Washington because of our excellent potential. In fact, we were told we would probably receive more work than we could handle once appropriations were processed.

That was 6 months ago, and on a recent call-back, I found that the survey request had not even been mailed. I was assured it now would be done without delay, "but it might take 3 months before Washington would get around to it."

Unfortunately, our supply of polystyrene has been steadily decreasing since last summer and our January allocation is only one-fourth of what we actually require.

Our finished-goods inventory is at extremely low levels, and our supply of raw material is not even on a day-to-day basis. There are frequent shutdowns, and it is becoming impossible to maintain a sound operation. Unless immediate relief is offered, many plastic plants with equally fine war potentials may also fall by the wayside before the Government tells us just what they want us to do and make.

So that we may continue in operation until then, and be able to serve our country when it will sorely need us, we must have more

powder. To fail us in this regard will mark the beginning of a tragically short-sighted policy. Today it is plastics—tomorrow it may be metal. In 1952 some overzealous official may figure that we consume too much gasoline and rubber in driving to the polls, and, Senators, your own jobs may be at stake.

Certainly our Government, which has spent so many billions to fortify the economy of foreign nations, cannot be insensitive to the needs of a typical American industry. We are not asking for hand-outs nor do you have to purchase our loyalty. You have it, and moreover, we are in a position to make an important contribution.

The injection molders offer this summation of our points:

1. This is an industry of small business.

2. Growth has been forced on the plastics industry by the demands for plastic products in applications where they have been the best logical materials to use.

3. This normal condition of growth has forced on the plastics industry the necessity for operating at a high production level to remain solvent. Restrictions in material supply will force the industry below the break-even point and bring about their financial destruction.

4. The plastics industry needs to be maintained, in the interest of national defense, during the interim period between a civilian economy and that time when we will be needed in an all-out war-production program.

5. The plastics industry's contribution in World War II demonstrates our potential contribution in any national emergency.

6. The plastics industry is uniquely adapted to mass production of identical parts with a simple change of tools requiring a minimum of change-over time.

7. Our ability to produce for war is vitally disturbed by loss of personnel trained in the special techniques of the plastics industry in the event of any forced shut-downs. These skills are not transferrable so this personnel loss in the plastics industry is not compensated by corresponding gains to other industries.

8. The reason we are all here today is that the very existence of our industry which has such a good defense potential is threatened by our loss of raw material.

9. To alleviate this situation we recommend first for immediate relief that action be taken on the recommendation in the report to Mr. Steelman submitted to him January 11, the main points of which are:

(*a*) A slight reduction in the styrene monomer content of GRS type synthetic rubber.

(*b*) Minor readjustments of procurement schedules of styrene monomer for GRS type synthetic rubber.

(*c*) Acceleration of the placement of military orders for plastic products.

At the same time immediate action is needed on long-term relief by facilitating the production of additional styrene molding powder by giving private industry the encouragement to carry out this program by furnishing certificates of necessity, priorities for construction materials, et cetera, to accelerate the building of facilities for manufacturing greatly increased quantities of benzol, styrene monomer and styrene molding powder.

It is suggested that a plastics industry advisory committee serving the NPA authorities be created to insure that war contracts be awarded to established concerns best equipped to handle them, and deal with the other problems that confront our industry.

Thank you very much.

The CHAIRMAN. Mr. Sauey, of the Flambeau Plastics Corp., we are glad to have you. We have your statement. It will be placed in the record in full.

Will you summarize it, or hit the high spots, whichever way you want to do it.

STATEMENT OF W. R. SAUEY, PRESIDENT, FLAMBEAU PLASTICS CORP., BARABOO, WIS.

Mr. SAUEY. Thank you, sir.

I would like to point out one fact; that is, many firms in our industry started operations after the last war. That is true with our plant, as we started operations in 1947; and, naturally, with a very limited amount of capital, which you will find true in most of our industry.

We continued to expand; and early in the year 1949 we purchased the complete facilities of another plant, increasing our capacity.

Our business continued to increase; and it was necessary for us to purchase additional equipment, which set us back financially approximately $60,000. This, of course, required additional space; so we purchased a plant at Baraboo, Wis., and moved to the new location. This moving made us incapable of carrying an inventory, leaving us with practically no material, and facing a shortage during the month of April 1950.

Immediately thereafter a shortage of benzene supply existed, or started. Therefore, we could not receive any material for our additional capacity that we had installed during the early part of 1950.

This, you will find, is true with many molders, who have increased their capacity during the early part of 1950, or the latter part of 1949. It is necessary for us to continue operations, or continue to stay in business, until we are able to turn to any defense items, to receive some assistance at this time, during this critical material shortage.

I would like to point out another fact that exists, especially so in our plant, which is undoubtedly true in many other plants such as ours. We live in a city where there is a very small amount of population, 8,000. There are seven industries in our city which employ approximately as many employees as we do. During the middle part of 1950 we employed approximately 50 employees. However, at this time, and due to this material shortage, our employees have decreased to the extent that we now only have 16 employees, with a plant that requires at least 60 employees to keep it in operation, and keep financially strong.

We have made every attempt to turn over to items that would prove very essential to the civilian economy, as well as to the military. However, this takes time and capital; and, with the material that is made available to us at this time, you can readily see why it would prove very unprofitable as well as impracticable to go into that at this time. Unless we are given relief during this situation, we will be unable to provide the things that we will be able in the event that we can continue production.

That is all.

(The statement of Mr. Sauey reads in full as follows:)

We started operation in the injection molding field in June 1947 at Bruce, Wis., with a limited amount of capital but looking forward into the possibilities of a tremendous program we firmly believed would take place within the years to come. Early during the year 1949 we purchased the complete facilities of another plant, expanding our capacity to two molding presses along with other equipment that is required to keep our plant in operation.

Our business continued to increase, requiring additional facilities; so, during November and December of 1949, we purchased three additional molding presses at the cost involved of approximately $60,000. This, of course, required additional space, so we purchased a plant at Baraboo, Wis., moving there during the month of March, at which time our machines were delivered. This moving made us incapable of carrying an inventory, finding us with practically no material and faced with a shortage which started in April 1950.

This shortage required the material suppliers to form some sort of allotment program based on purchases of 1949 and 1950, leaving us with an extremely low purchase record poundagewise. Being that we had no inventory and had increased our molding capacity 80 percent on which we could not receive any allotment, our company was immediately turning into a stalemate. We made every effort to have our material suppliers boost our allotment; however, we were informed they must continue the program that they had formed.

Our present molding capacity requires a minimum of 120,000 pounds of molding material per month based on production records. The total of our allotments from our two suppliers of polystyrene, of which we use 90 percent in our production, would be approximately 7,000 pounds. We have been advised that this may be cut back due to shortages that may arise which is unknown at this time. Our February allotment, we are informed, will be approximately 5,000 pounds of polystyrene, as we are informed that the styrene monomer will be decreased for production of polystyrene.

Before we had increased our capacity to the extent as mentioned above, we had requested some assurance from the material suppliers as to future supply of molding material. We were informed that there was an abundant supply of polystyrene, and to the best of their knowledge this supply would continue to increase, furnishing us with the necessary material to manufacture on the increased capacity.

We requested their giving us serious consideration on furnishing us with a minimum amount of material for our total capacity. They had informed us that they had no order to go by and that they cannot change their policy; thereby, they could not help those out who were in a position as that of our company. We requested a minimum amount of 40,000 pounds on our capacity to use 120,000 pounds of material.

Another problem which exists is unemployment in our city, forcing our help, especially those with experience in our industry, to find work in other cities, leaving us unable to obtain them if and when they are required. Our previous employment has been approximately 50 employees, and has been reduced because of this shortage to 22 employees. Our city of Baraboo has a population of 8,000 with seven industries approximately the size of ours; and, therefore, the employment is needed.

Presently 75 percent of our production goes into consumer products such as cheese containers for food manufacturers, thread boxes, tumblers, salt shakers, et cetera, and the remaining consists of industrial parts such as knobs, fittings, cases, and other end uses. We are making every attempt to change to items which would prove essential to civilian economy; however, this takes time and capital, and with the material supplied us at this time makes it both an impossibility and unprofitable.

Also, we are doing our utmost to obtain defense contracts and subcontracts as well; however, there have been very few, to the best of my knowledge, defense contracts released to our industry. We have strived to continue our operations. However, we find that we will be forced to close our plant if we do not receive some aid within the near future. This material problem has continued for us for nearly a year, and our amounts of material allotted have continued to decline.

The CHAIRMAN. Thank you very much.

Now, Mr. Finger, of the Corrulux Corp.

STATEMENT OF JOSEPH S. FINGER, PRESIDENT, CORRULUX CORP., HOUSTON, TEX.

Mr. FINGER. Gentlemen, I will make this very short and very sweet.

The CHAIRMAN. Your statement will be placed in the record in full.

Mr. FINGER. All right.

I really am here in the dual purpose, representing both my company, Corrulux, of Houston, Tex., and also the reinforced-plastics companies throughout the country.

We are really very small and even newer than the polystyrene injection molders.

The difference between the polystyrene and polyester field is that we incorporate reinforcing materials in a slightly different type of base plastic. That base plastic requires styrene for its manufacture, as well as for certain blending purposes.

So, rather than to get technical with you, and take up time telling you the difference, just go on the fact that we do require styrene in the manufacture of the base material on which we are 100 percent dependent.

My particular company happens to be making shadowproof skylights for industry. Recently, it has been going into such uses as Atomic Energy Commission, aircraft hangars, personnel barracks for the Navy and Army, and a few others like that. Certain specialized uses, such as rocket experimental stations. That is a part of our business.

Other parts of our business are those industrial skylights, decorative partitions, and things like that.

We have a very strong and very lightweight material, which can be used as a substitute for critical aluminum and steel in many cases. These products have found such use in industry. As a matter of fact, the projects which are under way and under consideration by the military at this time involve such things as rockets, guided missiles, assault boats, Arctic shelters, and a number of very important defense items.

The big trouble with our industry right now is there are not enough of these defense orders to tide us over this period between the time we are on civilian business and the time that we are 100 percent on defense business. Therefore, we must have a certain and reasonable amount of regular civilian orders if we are expected to survive.

The growth of the polyester or reinforced-plastics field has been even more phenomenal than the polystyrene field, perhaps. The companies are extremely new. The average age is 3 years; the oldest is 7½ years. Therefore, our growth picture is even more critical.

We have the same financial troubles that the polystyrene boys have. We have a very high ratio of fixed assets to working capital. Therefore, if we are cut down on our volume of materials available to us, it is obvious we are going to reach a point at which we can no longer meet our overhead. This, coupled with the fact that the profits are being cut down by certain taxes—which I understand your committee has reported very favorably on in behalf of small businesses; and for which we want to thank you—makes it very difficult for us to stay in business on a greatly cut-back schedule.

So we are asking, if you consider projects such as the rocket tube launchers—and here is a piece of pipe that the military wants for

transporting petroleum products; two men can lift a 20-foot section—if you are really interested in shadowproof skylights and guided-missile parts, that you consider the reinforced-plastics industry as essential, and give us enough raw material to tide us over between that time where we now stand and the time when we will be on 100-percent defense basis.

Furthermore, please make it possible for us to exist financially by giving us some help on these new profits taxes, which are exceptionally unfair to small business.

(The statement of Mr. Finger reads in full as follows:)

My company, Corrulux Corp., Houston, Tex., is engaged in the manufacture of reinforced plastic products. Our total assets are about $200,000. We have been in business 2 years and employ 68 people.

By reinforced plastics, the industry refers to those products made of polyester resins containing styrene monomer or similar resins and reinforced with certain fibers, such as rayon, cotton, nylon, but usually glass. Here is a sample of the glass mat usually used.

Combinations of polyester resins and glass fibers produce products of unbelievable strength, weather resistance and low weight, which can be substituted or used as improvements for critical aluminum and steel in a great many cases. Polyester plastics, or resins, require styrene in the manufacture of the base plastic as well as for blending the base plastic to a workable consistency. The liquid polyester resins should not be confused with polystyrene plastics, of which you have been hearing today. The polyester industry is probably less than one-fiftieth the size of the polystyrene industry.

My company makes a product out of glass fibers and these styrene-containing resins. We call this product Corrulux. Here are samples. Corrulux is primarily used as a shatterproof skylighting of daylighting panel in industrial buildings in conjunction with corrugated metal and corrugated asbestos. Most of the Corrulux we manufacture for civilian orders goes into industry such as steel mills, chemical plants, railroads, manufacturing plants, and aircraft hangars. A much smaller amount goes into office partitions, shower stalls, awnings, and similar uses. We have already been forced to cut back civilian orders due to lack of sufficient raw materials.

My company started an expansion program in February 1950, as we found that our plant was insufficient to meet normal demand. This expansion program added nearly 50 percent to our assets and 125 percent to our productive capacity. Initial production from the new facilities started in November, and in that same month our raw materials supplies were cut. We had to lay off 25 percent of our trained operating personnel in December. And, if our styrene availability is cut further, we are going to lose more trained personnel, and we would stand a good chance of losing our investment.

This situation exists in several other reinforced-plastics companies with which I am familiar. The real picture is this: Most of these companies had only started in the past year, or two, or three. In the early spring of last year their products were just beginning to take their normal place in the market, so that expansion in the spring and summer of 1950 was a perfectly logical one. In most cases these expansion programs had nothing to do with Korea. The industry as a whole was just beginning to crawl after an extremely unprofitable infancy.

Recently, the Armed Forces have started using Corrulux in appreciable quantities for (1) rocket experimental stations, (2) for the Atomic Energy Commission, (3) mobile aircraft hangars, (4) barracks for military personnel, (5) military warehouses.

We have also started supplying a prime contractor for the Air Force, a reinforced plastic liner for hospital planes.

Our problem at present is that we cannot yet count on a continuous flow of these defense orders each month, and therefore we must depend on our normal industrial orders for staying in business.

The same materials, that is, polyester resins and glass fibers, which we use for Corrulux panels are used in the following projects for the military: (1) Radar housings, (2) guided missiles, (3) rockets, (4) assault boats, (5) helmets, (6) arctic shelters, (7) aircraft parts, (8) lightweight pipe for petroleum products, (9) lockers and field desks, and (10) Doron body armor for flak protection, and many other projects which the Corps of Engineers, Navy, Quartermaster, and Air Force here in Washington can present to the committee more completely than I. These

projects and others of a classified nature are being developed, prototyped, and put into very limited production by small reinforced-plastics businesses such as ours.

The fact that all reinforced-plastics businesses will be affected by any regulation governing styrene prompts me to read excerpts from a letter to your committee from Mr. Leonard S. Meyer, chairman of the reinforced-plastics division of the Society of the Plastics Industry, Inc.

The letter is addressed to Senator Sparkman, and I quote:

"This letter is to bring to your attention a condition which we believe you are already pledged to alleviate.

"Reinforced plastic products were born during the last war and developed from special requirements for large plastic products needed for aircraft and other war production. After these efforts a few small companies were started to continue this type of work for new postwar civilian end products. These companies today are suffering an impending loss of capital investment and threatened with shutdown due to the lack of an extremely small amount of monomeric styrene.

"The actual lack is for polyester resin as produced by the major plastic resin manufacturers. Styrene in monomeric form is approximately 33 percent of this type of resin.

"Listed below are 22 companies who account for 90 percent of the consumption of this resin, with the civilian end uses of the products made and the age of their operations:

Company	Age	End uses
	Years	
Hubbard Reinforced Plastics Corp., 5755 Ogden Ave., Chicago, Ill.	2	Sporting goods, home appliances.
Frank C. Snedaker Co., 3512 North 9th St., Philadelphia, Pa.	1	Kitchen cabinets.
Alsynite Co. of America, 4654 DeSoto St., San Diego, Calif.	2	Building panels.
Wizard Boat Co., 2075 Harbor Blvd., Costa Mesa, Calif.	3½	Boats, fish, and game water reservoirs, water-softener tank.
D. G. Williams Co., 423 38th St., Brooklyn, N. Y.	6	Mannequins, display forms and equipment.
Western Sealant Co., 9042 Culver Blvd., Culver City, Calif.	3	Plastic and metal castings.
Zenith Plastics Co., Gardena, Calif.	6	Furniture, gas-meter housings.
Auburn Button Works, Auburn, N. Y.	2	Cases for instruments; containers, housings.
Beetle Boat Co., Foot of Grinnell St., New Bedford, Mass.	5	Boats and miscellaneous.
Molded Resin Fiber Co., Benefit Ave., Ashtabula, Ohio.	2	Food trays, evaporation pans; refrigerators and coolers.
Laminated Plastics Co., 1823 East 40th St., Cleveland, Ohio.	5	Electrical apparatus, chemical processing industry; food handling equipment, refrigerator parts.
Apex Electrical Manufacturing Co., 7424 Bessemer Ave., Cleveland, Ohio.	3	Tubs, dishwasher.
Western Products, Inc., Newark, Ohio	5	New housing, furniture industry.
Corrulux Corp., 410 Holmes Rd., Houston, Tex.	3½	Housing, aircraft hangars, transportation, communication, utilities.
Winner Manufacturing Co. Inc., Trenton, N. J.	6	Low-pressure laminating.
Ford Moulded Fibre, 60 North Rose St., Mt. Clemens, Mich.		Boats.
Continental Can Co., Cambridge, Ohio	7½	Decorative and industrial laminates for electrical and aircraft field.
Sparton Co., 2900 Emerson Ave. South, Minneapolis, Minn.	5	Medical vaporizers.
Woodall Industries, 7567 East McNichols Rd., Detroit, Mich.	1	Wall panels, table tops, bench tops, sink tops.
Fibremold, Inc., 125 Riverside Ave., Medford, Mass.	2½	Bread trays and containers.
Perrault Bros., Lami-Rock Division, Sand Springs, Okla.		Oil field piping, gas and water mains, industrial and military piping, structural columns.
Westport Fibre Co., Westport, Mass.	½	Boxes and trucks for textile trade, tanks for plating industry.

"1. The end products are in the main essential civilian uses such as housing and food production.

"2. The ages of these companies are young indeed—the oldest being only 7½ years.

"The above companies use 1,000,000 pounds of polyester resin per month and this quantity of resin required 333,000 pounds of monomeric styrene. Industry as a whole will increase these amounts to 1,100,000 pounds of polyester and 370,000 pounds of styrene per month. This amount of styrene can be balanced

against an investment of new capital which totals $4,000,000 and the desire by these companies to keep operating until conversion can be made to defense work."

I would like to emphasize a couple of points in Mr. Meyer's letter, for they apply to my company's position in this matter also:

First of all, all of the companies in the manufacture of reinforced plastics are relatively very small and very new. The oldest is 7½ years old, and the average age is closer to 3 years. Yet these small new companies are the ones who are doing a large amount of work on projects concerning rockets, guided missiles, radar, aircraft, and other highly important military projects. These companies have developed and are developing the know-how, the techniques, and the trained personnel to make these products required by the military.

The techniques of manufacture of reinforced plastics are entirely different from all other plastics manufacture. You cannot use the same equipment, tooling, or techniques for reinforced plastics as you use in other plastics industries. And the personnel must be trained along entirely different lines.

The reinforced plastic companies are getting some defense orders; but the defense orders, in general, are small, sporadic, and insufficient to keep the businesses alive. We must have civilian orders to stay in business so that we can hold together the equipment, know-how, and trained personnel necessary to carry out these various military orders when we are called upon.

The projects under consideration, and being developed and even now produced in small quantities for the military will eventually require far greater production than the combined reinforced plastics industry now produces. Therefore, it is essential to our defense effort to sustain these manufacturers for that future time. This can only be done by allowing a reasonable quantity of styrene for the production of the resins we require, and allowing us to maintain a reasonable portion of our civilian business.

Our total requirements of styrene for the entire reinforced plastics group are very small. The best figures available indicate that less than 5,000,000 pounds of styrene per year will keep these important businesses going on civilian orders. This is less than 1 percent of the Nation's present output of styrene. When you consider that reinforced plastics play a very important part in the military and industrial defense effort, this 1 percent or less is cheap insurance that will tide over the reinforced plastics industry until it is on a maximum defense basis.

The CHAIRMAN. Any questions, Senator Thye, of this group?

Senator THYE. No.

The CHAIRMAN. Senator Benton, can you wait a few minutes?

Senator BENTON. I was going to go out and try to talk with Mr. Finger for a few minutes. You can tell this is a new industry, because these men are all so young and energetic.

Mr. FINGER. No one with mature judgment would ever get into a business like this.

Senator BENTON. I know there are problems. They are a fine looking bunch of men.

The CHAIRMAN. Old men dream dreams; young men have vision.

Do you have any questions?

Senator HUNT. I have no questions.

The CHAIRMAN. Thank you very much, gentlemen. We want you to know that we are in complete sympathy with your program as you have presented it here.

By the way, Senator Thye, if you are about to leave, I want to say to you, and to all present, that in the recently filed report of the Small Business Committee, there is a very interesting section on the plastics industry, starting on page 24, and continuing to the middle of page 31. On pages 28 and 29 are a couple of diagrams which illustrate the production of styrene and the flow of it into these various uses.

Now we have Mr. Turnbull of the Monsanto Chemical Co.

Mr. Turnbull, we are glad to have you with us. You have a prepared statement?

STATEMENT OF J. R. TURNBULL, GENERAL MANAGER OF SALES, MONSANTO CHEMICAL CO., PLASTICS DIVISION

Mr. TURNBULL. I have a very brief statement that I would like to make, which I will put in the record later.

The CHAIRMAN. That is all right, sir. Proceed in your own way.

Mr. TURNBULL. In view of the very good coverage of the industry, I think it might be my function to clarify the role of the styrene monomer.

The CHAIRMAN. Let me say, Mr. Turnbull, your company is a producer rather than a processor?

Mr. TURNBULL. My company is a raw material supplier; and in addition to making styrene monomer and polystyrene, we also happen to produce most of the other commercially used raw materials.

The CHAIRMAN. Is Mr. Hobson with you also?

Mr. TURNBULL. Mr. E. L. Hobson is the sales manager of our polystyrene department.

It happens that the most critical shortage, as of the moment, as I think the testimony brought out today, is the polystyrene shortage.

(The statements, in press release form, as submitted by Mr. Turnbull are as follows:)

"Present production of plastic materials is inadequate to meet industry demands," J. R. Turnbull, general manager of sales for Monsanto Chemical Co.'s plastic division, stated in his testimony before the Senate Select Committee on Small Business. All records for production and consumption of plastics and synthetic resins were broken in 1950. The demand originates in consumer goods and industrial applications where, Mr. Turnbull emphasized, plastic materials are being used in preference to any other material because of superior properties and not as substitutes. Currently the industry is now under heavy pressure from manufacturers whose use of critical metals has been curtailed, and who would like to use plastics as temporary replacements for these metals and other critical materials. The industry will probably not be able to service these demands except where a military or extremely essential end use is involved until expansions of plastic materials are effective.

Monsanto and other producers of plastic raw materials have scheduled substantial expansions of their output during 1951 and 1952. In order for these new facilities to be fully effective, a comparable expansion of the basic chemicals required for the plastics industry must be accomplished. One of the most serious shortages, Mr. Turnbull pointed out, is that of benzol. The chemical and plastics industry today depends primarily on benzol, which is mainly produced as a by-product of the manufacture of coke for the steel industry. Steel production, even at today's high levels, can no longer supply the need for benzol. Even projected steel expansions will provide only a slight relief since each new ton of steel capacity makes available less than 2 gallons of new benzol output. As a specific action, Mr. Turnbull recommended encouragement of additional benzol production from petroleum.

Encouragement of additional benzol-producing facilities was recommended today by J. R. Turnbull, general manager of sales for Monsanto Chemical Co.'s plastics division, in his testimony before the Senate Select Committee on Small Business.

The Senate committee is investigating the impact of material shortages and allocations on the Nation's small business.

Mr. Turnbull said that his representation from a large company gave emphasis to the fact that large companies were just as dependent on many small businesses as the small businesses were dependent on the larger manufacturers. "The interdependence of large and small business is a characteristic of the American business scene," said Mr. Turnbull.

Drawing a quick picture of the plastics industry, Mr. Turnbull pointed out that 98 percent of the plastic molders employed less than 500 people and that this group of small companies was an example of the best in progressive, competitive private American industry. There are no giants taking big percentages of the available plastics materials.

In fact, Mr. Turnbull reported, to illustrate this point our biggest customer for injection molding materials took less than 4 percent of our total output last year.

In continuing his story of the plastics industry, Mr. Turnbull made frequent references to the remarks of Mr. William Cruse of the Society of the Plastics Industry. Mr. Turnbull said that a material manufacturer dealing with many of the individual companies in the plastics business have a good opportunity to form a national and industry-wide impression. Because of this viewpoint, Mr. Turnbull felt that he could best serve the committee by helping to delineate the growth, the present picture and the future prospects of the plastics industry.

In discussing the growth of plastics, Mr. Turnbull presented two interesting charts. One showed the growth curve of general industry since 1850 compared to the sharp climb of the plastics industry growth. The other showed the growth of the plastics industry from 1939 to 1949 in comparison with the growth of the material industries such as copper and aluminum. In the latter chart, it was significant that in this 10-year period plastics had a phenomenal growth of 600 percent while its closest runner-up (aluminum) increased 279 percent.

In the growth of the plastics industry, there has been a tremendous broadening of the base of application. One spectacular evidence of this has been the way the refrigerator industry has turned to plastics. In 1940, one refrigerator manufacturer used plastics in a very minor role. By 1950, they had increased their usage of plastics to over 24 pounds. As industry in general has demanded of it, the plastics industry has created answers to new problems. One evidence of this has been the great increase in the size of injection moldings. Charting this since 1939, Mr. Turnbull showed an increase from 6 ounces to 300 ounces. Supporting this, Mr. Turnbull had on display several large moldings including an injection molded battery case weighing 11 pounds. In summarizing this application story, Mr. Turnbull said, "Literally, today, the wheels of industry would not turn without plastics. There would be no communications, no power, no shaping of metals with plastic bonded abrasive wheels, no speedy shell molding (a new foundry technique using plastic resins)."

Much of the growth of the plastics industry can be attributed to the advantages of plastics as a material. Mr. Turnbull pointed out that plastics being man-made materials, could have built into them the properties the designer wants. Some to the advantages common to many of the plastics materials are their ease and speed of production, their light weight, the fact that they need no painting or other finishing, and the fact that many parts can be molded in one piece, saving assembly time. Other properties that make plastics popular with the design engineer are good electrical properties, low water absorption, and good dimensional stability.

Turnbull said that particularly significant in these times was the fact that plastics production from raw material to finished goods required less electrical power and less manpower than any of the other standard materials. When plastics are available, they can be used for many essential civilian and military uses to conserve our supplies of copper, aluminum, metal, and other critical materials.

In discussing Monsanto's allocation policy, Mr. Turnbull stated that the allocation of materials was based on the customer's historical purchase record. Admittedly, he said, this does not allow for the continued growth of the industry, and most critical today, it does not allow for the expansions and new equipment planned many months ago and now in existence crying for materials. This is a vigorous young industry in which growth still is a vital part of the picture, said Mr. Turnbull. Also, because it is a young industry used to the creation of new ideas and the quick adaption of new conditions, it is an industry that can be extremely useful in meeting the needs for new ideas in armament production. This was demonstrated in World War II by the creating ability displayed in designing and producing the intricate plastic parts from such a key component as the promixity fuze.

In discussing the shortages of styrene molding material, Mr. Turnbull pointed out that plastic manufacturers have built and are building ample manufacturing facilities to make the molding powder from styrene monomer. Also, they are building plants for synthesizing styrene monomer from benzol. The bottleneck today is the benzol supply.

In concluding his testimony, Mr. Turnbull made a strong appeal for Government encouragement to private industries' plans for producing benzol from petroleum. Benzol, historically, has been a byproduct of the manufacture of coke for the steel industry. Steel production, even at today's high levels, can no longer supply the need for this fundamental raw material of the organic chemicals

and plastics industry. The projected expansions of the steel output will provide only slight relief since each new ton of steel production capacity makes available less than 2 gallons of new benzol output. The feasibility of processes to make benzol from petroleum have been demonstrated and the construction or expansion of such facilities are badly needed. Short-term amortization of petroleum-benzol facilities is one specific way in which the Government can assist in furthering these projects.

The CHAIRMAN. Any questions, Senator Hunt?

Senator HUNT. None.

The CHAIRMAN. Senator Thye?

Senator THYE. No, thank you.

The CHAIRMAN. Thank you very much, Mr. Turnbull.

We are indebted to all of you gentlemen for giving us this picture today of this new and young industry. We want you to know that if we can help in any way, we are eager to do it.

I want to place in the record at this point a letter addressed to me, under date of January 17, 1951, by Mr. W. A. McCallum, president of the Luminescent Plastics Corp.

(The letter referred to is as follows:)

LUMINESCENT PLASTICS CORP.,
Chicago 6, Ill., January 17, 1951.

Hon. JOHN SPARKMAN (Alabama),
Chairman, Small Business Committee,
United States Senate Office Building, Washington, D. C.

DEAR SIR: In talking to Mr. Ben Rau, chairman, Society of the Plastics Industry (Chicago section), today, we were informed that a hearing on the critical plastic situation was to be held by your committee next Tuesday, the 23d.

We understand certain invitations have been issued to some of the plastic molders, however, we thought it well, at this time, to bring our serious situation to the front. Although over the past 5 months we have laid our situation in detail before the following: Charles F. Hughitt, Chief of Small Business Division of the Department of Commerce; President Harry S. Truman; John R. Steelman, President's Assistant; Economic Cooperation Administration; Sidney R. Yates, Ninth District, Illinois; Society of the Plastics Industry, all of whom advise of a shortage of polystyrene due to the rubber program and that some effort is being made to relieve the situation.

We also have orders placed with the following companies: Bakelite division Union Carbide & Carbon Co.; Dow Chemical Co.; Catalin Corp. of America.

Some of these companies have rejected the orders. Others have kept the orders stating that we would be placed on allocations but we have not received a pound of material from them. Monsanto Chemical Co., however, has given us a total poundage equivalent to what we received in 1949 but the greatest portion of this was received prior to May of 1950. Since that time we have been closed down a total of 115 working days due to the spasmodic shipments in amounts that cause operations to show a serious loss. At this time our plant is closed down and we do not know when we will open up again.

The various Government branches mentioned above have suggested that we get into war work. Realizing the situation, we have been making every endeavor to get into war work. As a matter of fact, have been running a number of costly tests on new material for subcontractors who have yet to receive orders for such materials. Naturally, to pay for these costs, we must receive materials to take care of our domestic business.

When the Economic Cooperation Administration, under the Marshall plan, came into effect, we became interested in seeking foreign orders. Our instructions from the Economic Cooperation Administration were to secure agents. This we did. These agents went to considerable work and we went to considerable expense advertising, etc., to develop this foreign business. Orders came in accompanied by letters of credit and Marshall plan export licenses. The Department of Trade and Commerce have since issued the export licenses. These orders have accumulated to a total of some 40,000 pounds and still we cannot get from the chemical companies 1 pound to fill these orders.

The Economic Cooperation Administration advises that they have no authority to request any chemical company to furnish us with the material (polystyrene)

due to the fact that they are not under Government allocation. The allocations are run by the chemical companies themselves.

I have in front of me a letter from Sidney R. Yates, Ninth District, Illinois, which advises as follows:

"I have checked with Mr. Charles F. Hughitt, Chief of the Small Business Division of the Department of Commerce, concerning the matter, and he stated that when and if the President signs the controls bill which has been passed by the Congress, and designates the Department of Commerce to handle the matter, they will immediately enter into an inventory control and allocations program on critical items. However, such allocations will apply at first only to defense orders. There will be no mandatory allocations for civilian activities until hardship is proven in a specific industry, at which time the President may move in and allocate materials."

As you will see, we are wondering how long hardship must continue before any action is taken. If no relief is given, then we must cease to do business.

To give you an idea of this corporation's operations: In October 1947 this corporation was incorporated for perpetuation of a branch of the business that had more or less been looked down on by the chemical companies for the reason that it did not mean tonnage to them, it being a specialty business.

The materials manufactured by these companies were by no means equal to the superior materials that we have been manufacturing and turning out. As a matter of fact, we have every reason to believe that these chemical companies were happy to see someone go into the business of processing luminescent plastics which relieves them of any headaches in view of the fact that they were after tonnage. So much so that one after the other came to us for the raw-material business stating that they had discontinued the manufacture feeling that we could very well take care of the situation.

Naturally our sales in 1948 were small. We had considerable development work to do which development work has continued up to date. We now have a plant with a capacity to take care of all requirements regardless of what the base material may be. In other words, we are capable of manufacturing under a single roof all the materials that heretofore were manufactured from five different bases by five different chemical companies.

In 1949 our sales doubled those of 1948 and our sales in 1950 were over five times that of 1949 to say nothing of the tonnage that we had to turn down due to lack of materials and still we were able to ship only the same amount that we shipped in 1949 due to this lack of materials.

We have on hand at this time for domestic purposes some accumulated orders to the tune of 70,000 pounds. None of which we can ship due to lack of materials although we are spending money on development of types of material for the Armed Forces.

In looking over the receipt of material in the last 6 months, we find that, where we have a normal capacity to turn out on one shift (although we can work three shifts) 30,000 pounds, we have received during the month of—

	Pounds
May	6,000
June	4,200
July	3,000
August	0
September	5,000
October	0
November	2,000
December	2,000

and we are advised today by Monsanto Chemical Co. that there would be no more material until March of this year. You can readily see under such an operation, why we lost 115 days during the past 6 months.

We believe that this is an outstanding hardship case that is not surpassed by any other company in the United States. Under this special and critical situation, we believe that we are entitled to every consideration possible to allow us to complete our orders for domestic business until such time as we can secure war work either direct or by subcontract for our materials. You can be assured we are making every endeavor under the circumstances.

We are, therefore, requesting your full consideration and advice as to what can be done on our behalf.

Yours very truly,

LUMINESCENT PLASTICS CORP.
W. A. MCCALLUM, *President.*

The CHAIRMAN. If there is nothing further to come before the committee, we will stand in adjournment until 10 o'clock on Friday of this week, at which time we shall take up the aluminum question.

The committee is adjourned until that time. We will meet in this room.

(Whereupon, at 12:35 p. m., the hearing was recessed, pursuant to reconvening Friday, January 26, 1951, at 10 a. m.)

APPENDIX A

THE PLASTICS INJECTION MOLDER—HIS PROBLEM OF MATERIAL SHORTAGE

SUGGESTED SOLUTIONS

THE SOCIETY OF THE PLASTICS INDUSTRY, INC.,
New York, N. Y., January 10, 1915.

DR. JOHN R. STEELMAN,
Assistant to the President of the United States,
The Executive Offices, The White House, Washington, D. C.

DEAR DR. STEELMAN: Following our meeting with you on November 15, 1950, we have proceeded to take the action you then outlined.

On November 22, through the arrangements you made, we conferred with Mr. John C. Houston, Jr., your special assistant, and Miss Marjorie Belcher. We reviewed with them the problem which the shortage of polystyerne imposes on the injection molders and made several suggestions on how, in our opinion, this shortage might be alleviated. Mr. Houston requested that we submit our analysis of the problem and our suggestions in writing, conforming with the proposal which you made. This we are doing herewith in this complete report and the attached brief visual summary.

Our appraisal of the problem and its possible solution follows:

INTRODUCTION

When in September of last year the Office of Rubber Reserve was ordered to undertake all-out production of GR–S type synthetic rubber, this imposed an unprecedented demand on the country's styrene producing facilities with the result that a shortage was then created. The plastics injection molders who depend upon polystyrene faced cut-backs. Since then the amount of material they have received has been reduced and they were informed that after January 1, 1951, they were to receive even less. This disturbing development caused the molders to see if there wasn't some possible relief from this shortage. The injection molders held an industry-wide meeting in New York on October 9, when they reviewed this common problem. It was then apparent that it would be necessary to give the subject further study. The injection molders, therefore, established a committee to deal with this and other national defense subjects. The committee was designated as the injection molders' committee on national security. Since the 700 molders in the United States are predominantly small-business firms they envisioned this type of procedure as being the only one whereby they could deal with this involved problem.

In proceeding in this matter the committee took cognizance of the respect the Government has for small business. In the second report of the Preparedness Subcommittee of the Committee on Armed Services, United States Senate, the subcommittee recognized the problem of the small rubber manufacturer when it advised the National Production Authority as follows:

"In this connection the subcommittee recognizes fully the place of small business in our national economy and strongly urges the National Production Authority to insure that any limitation order deal fairly and equitably with companies in this category."

The problem which confronts the small plastic molder parallels that of the small rubber manufacturer.

The injection molders are fully aware of the need for expanded synthetic rubber production. They heartily endorse the action which has been taken to activate the production of synthetic rubber to provide for the Nation's strategic and stockpiling requirements.

The committee, in proceeding to explore the possibilities for relief, has consistently kept in mind the need for production of adequate quantities of synthetic rubber.

THE HARDSHIP WHICH CONFRONTS INJECTION MOLDERS

The plastics industry has been well known as one of the fastest growing industries on the American business scene. Injection molding has been one of the most rapidly growing segments of the plastics industry. While injection molding was a factor in the industry's production scheme prior to World War II, it has experienced its greatest growth since 1945 with the introduction in large quantities of polystyrene molding compound.

Styrene was first commercially used in this country for polystyrene molding compound in 1938. The plastics industry was the only producer and user of the material until the advent of the synthetic rubber program. At that time this program took over the product and process which had been developed. During World War II, styrene monomer was used in polystyrene molding compound for defense applications, alongside of styrene monomer for GR–S synthetic rubber. At the end of the war the plastics industry, due to a great expansion in the demand for polystyrene molding compound, took over larger and larger quantities of styrene monomer for its products. Because of the high level of consumption of polystyrene plastics, the styrene plants were maintained continuously in operation, ready for any eventuality. This continuing operation meant that styrene production could be almost immediately expanded to capacity, at a minimum cost in time and money. Furthermore, it meant that personnel would not have to be trained as would have been necessary with styrene plants in mothballs.

The outstanding growth of this industry is reflected in the following table:

Polystyrene production figures based on U. S. Tariff Commission

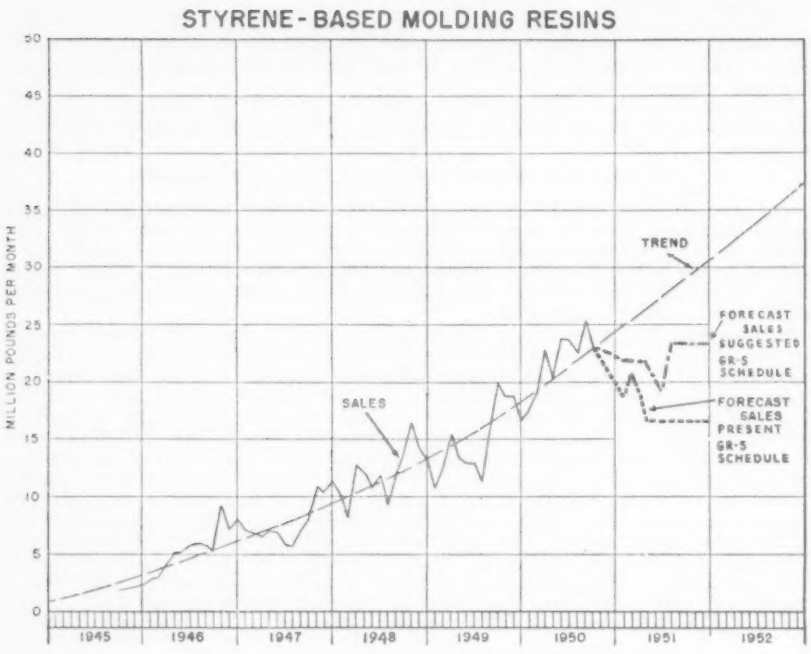
	Pounds		Pounds
1946	66,769,321	1949	183,884,041
1947	94,990,618	1950 (based on rate of production for 10 months)	251,000,000
1948	146,773,028		

	Production	Sales		Production	Sales
	Pounds	*Pounds*		*Pounds*	*Pounds*
1950—January	16,754,998	17,538,031	1950—July	23,054,988	22,765,814
February	16,397,808	19,193,614	August	23,138,953	25,385,043
March	22,724,146	22,027,472	September	24,545,665	22,906,116
April	20,280,481	20,344,048	October	24,324,689	25,457,751
May	20,937,159	23,760,985			
June	20,445,563	23,705,714	Total	212,604,450	223,684,588

The accompanying chart A reflects this growth on a monthly basis. It also projects this past rate of growth through 1951 and 1952. The chart also shows how the presently scheduled GR–S program will curtail the supply of polystyrene molding compound, based on the capacity of styrene monomer as stated by the Office of Rubber Reserve.

It should be noted that polystyrene is the basic-feed stock used by injection molders with no adequate supply of alternate materials being available. Thus this drastic drop in polystyrene availability is going to seriously affect injection molders.

CHART A



ECONOMIC DISTRESS FACES PLASTIC MOLDERS

1. *Failures.*—Because the injection molders will receive drastic cuts in the quantities of polystyrene molding compound which they need for operating their plants, it will be impossible for them to maintain a sufficient volume of production to meet their fixed and operating expenses. A large proportion of these companies are owned by small-business men who have invested personal capital. If this situation is allowed to remain unchanged, many of them are destined to fail. One molder, for example, pleading for relief reported that if it wasn't obtained he would lose not only his factory but his home and other belongings. There are a number of small molders who are in a similar position. Of the 700 injection molders in the United States the large majority of these companies employ less than 100 people. Less than 2 percent employ over 500. In the aggregate these companies have 28,000 employees.

One of the main reasons for the high break-even point which the injection molders have is the fact that they have had to expand exceedingly rapidly to attempt to keep up with the burgeoning demand for injection molded products. Small businesses, most of them, had to rely on borrowing and use of personal savings to finance this expansion. The net result is that they must operate close to capacity or face losses and failure.

2. *Lay-offs.*—The shortage of polystyrene molding compound has already made it necessary for some injection molders to lay off employees. As the shortage grows this trend will increase.

3. *Local area distress.*—There are certain areas in the United States where there is a concentration of small firms which do injection molding. Collectively they are an important factor in the economy of these regions. The adverse effect the inadequate supply of polystyrene is having, and will have, will upset the economy of these areas. Typifying such communities are Leominster, Mass., and Cambridge, Ohio.

4. *National security.*—In the interest of national security it is important to maintain the injection molders in a healthy operating condition. During the last war the injection molders were called upon to produce many components that were used by the military. These included proximity fuze parts, innumerable pieces for electronics equipment, Air Force and Signal Corps battery boxes, medical containers and many other applications. The same situation will prevail in the present defense effort. A number of military applications, now classified, are being contemplated that will require more injection molding capacity than was necessary in World War II. In addition to maintaining the mechanical equipment, it is also important to keep the personnel who are trained to operate these facilities employed.

Injection molding is inique in having the ability to produce a great quantity of intricate, close-dimension, precision parts up to 12½ pounds in weight (comparable on a volume basis to 93 pounds of steel) on a mass production scale with a minimum expenditure of labor and with a low tooling cost.

Because of these characteristics of injection molding, this method of plastics processing lends itself well to the production of many component parts used by the military. Many classified projects are now in the development stage which by virtue of their inherent requirements will employ this manufacturing technique.

Because of the unique characteristics of injection molding, many classified projects are being designed to employ the inherent advantages of this manufacturing process.

The United States is the only country which has a large-scale injection molding industry capable of producing large-sized injection molded parts.

5. *Injection press development.*—The advantages of large part injection molding have been attained by the research conducted by machinery manufacturers. This development work is seriously affected by the curtailment and cancellation of their orders. It is desirable from the standpoint of national security that this research continue.

1950 RUBBER RESERVE SCHEDULES

In May 1950, Rubber Reserve scheduled the 1951 annual production of GR–S at 480,000 tons (40,000 tons a month). In July 1950, the 1951 schedule was stepped up to 600,000 tons (50,000 tons a month). In September, Rubber Reserve increased the schedule for 1951 to 721,500 tons, by increasing the rate monthly until April when a rate of 750,000 tons per year is attained as follows: January, 50,000 tons; February, 52,000 tons; March, 57,000 tons; April to December, 62,500 tons each. Then in November, Rubber Reserve moved to step up the production of GR–S for January 1951 to 54,800 tons, giving an annual schedule for 1951 of 726,300 tons.

The many changes that were made in the indicated production schedule during the year presented a production problem to the styrene producers. These rapid changes in schedule occurred so fast that producers of styrene were unable to install new equipment to meet all demands that will be placed upon styrene early in 1951. The styrene producers were able to take care of the demands imposed upon them through the schedules that were established until the change in September. Until the September increase, sufficient benzene appeared to be available and operation of the expensive alcohol-based butadiene plants would not be required. Thus the shortages which now confront us have all occurred since the September schedule change.

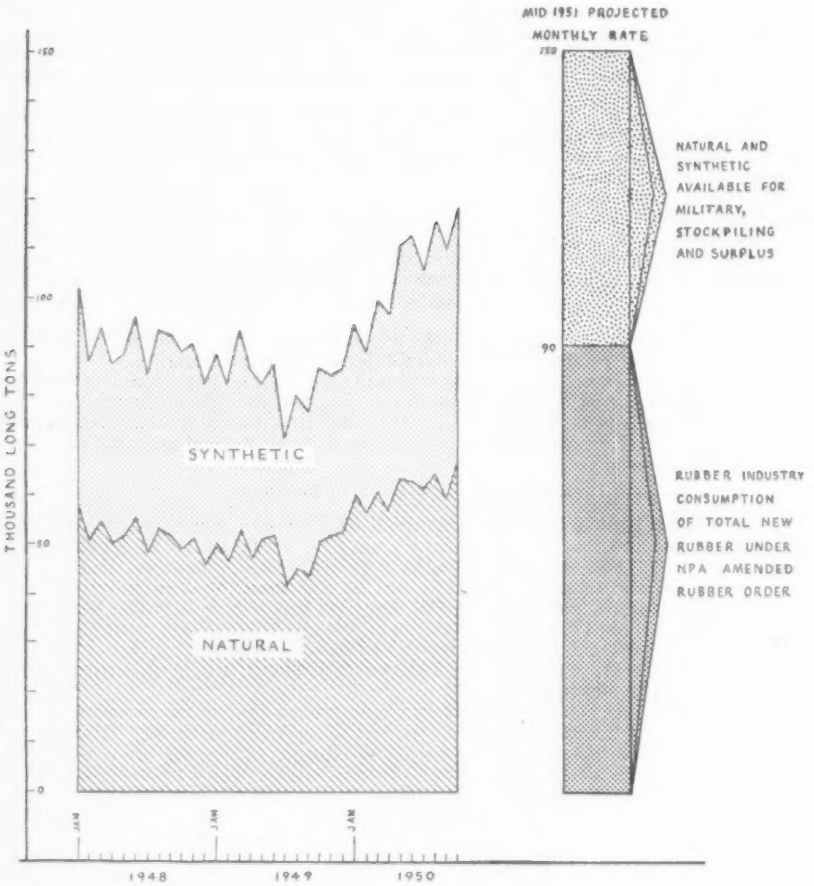
RUBBER INDUSTRY'S FEED STOCK REQUIREMENTS VERSUS FUTURE SUPPLY

Chart B shows the rate at which the rubber industry consumed natural and synthetic rubber through the years 1948, 1949, and through October 1950. The highest monthly consumption occurred in October 1950 when the rubber industry consumed 117,935 tons of new rubber. The rubber industry will have available by early 1951, 150,000 tons a month of new rubber, made up of 75,000 tons of natural rubber, 62,500 tons of GR–S and 12,500 tons of other synthetic types. This 150,000 tons a month is not only 60,000 tons greater than the 90,000 tons a month consumption visualized in Rubber Order M–2, but it is also 56,500 tons a month higher than the average new rubber consumption in 1947, the greatest production year the rubber industry ever enjoyed before 1950. This is shown on chart C.

CHART B

TOTAL NEW RUBBER

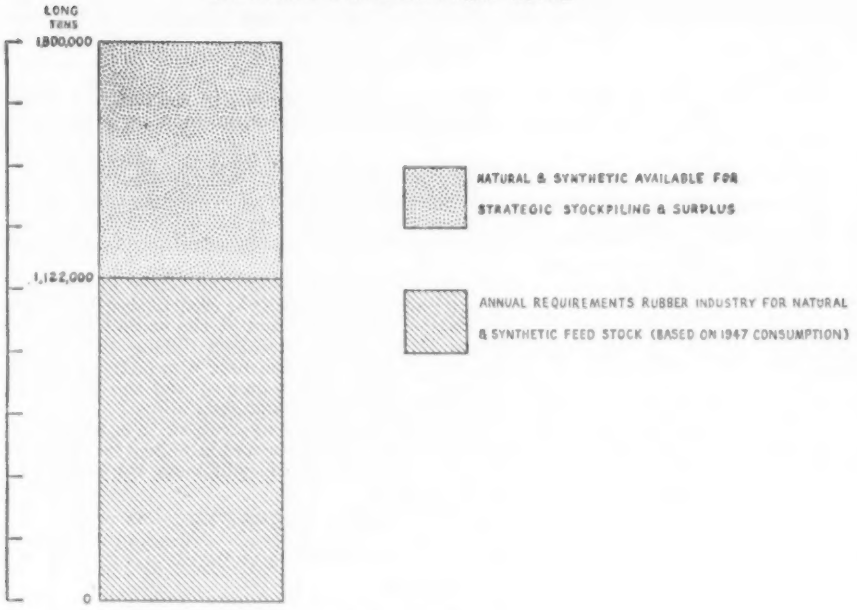
PAST CONSUMPTION VS. FUTURE AVAILABILITY



All of the production and consumption figures used in this report are based upon data obtained from the Department of Commerce and other sources. Since the rate at which natural and synthetic are being stockpiled is classified information, the committee does not have access to it. These requirements could not be indicated in the charts or otherwise. However, based upon the experience of World War II and the quantities which are to be produced, it seems apparent that the available rubber will be more than ample to take care of stockpiling, military requirements, and civilian needs. Although these quantities seem to us to be more than adequate, in the suggestions below we have advocated no course of action which would materially reduce the present programed synthetic output.

CHART C

ANNUAL PRODUCTION RATE


LONG TONS
1,800,000
1,122,000
0
NATURAL & SYNTHETIC AVAILABLE FOR STRATEGIC STOCKPILING & SURPLUS
ANNUAL REQUIREMENTS RUBBER INDUSTRY FOR NATURAL & SYNTHETIC FEED STOCK (BASED ON 1947 CONSUMPTION)

SUGGESTED COURSE OF ACTION

While a number of methods suggest themselves whereby the rubber and plastics industries' requirements may be taken care of, consistent with our strategic requirements, only the two which in our opinion are the most expedient under present circumstances are presented here.

1. *Reduce styrene content of GR–S.*—Basically, GR–S is a copolymer of butadiene and styrene. When butadiene polymerizes by itself, two types of polymerization occur (the chemist calls them 1,2 and 1,4) and the result, under normal circumstances, is an inferior product. The ideal butadiene polymerization would involve 1,4 additions alone. The role of styrene is not only as a second monomer; its presence tends to reduce the undesirable 1,2 addition and increase the wanted 1,4 polymerization.

When butadiene-styrene rubber was first developed in Germany the usual ratio was 68 parts butadiene and 32 parts styrene. When the GR–S formula was first developed in the United States, research work had been able to drop this to 72:28. Since the inauguration of large-scale synthetic rubber production in the United States, the proportion of styrene has been further reduced to its current figure of about 23 percent. Unless revisions are made, the GR–S produced in 1951 will contain 23 percent styrene.

Research work has continued, however, toward reducing still further the styrene content of GR–S. Both the rubber companies and the military have cooperated in testing GR–S formulations containing less than 23 percent styrene. These tests are still in progress. We are informed that the results so far indicate successful use of these low-styrene rubbers in passenger tires and for other uses. Polybutadiene rubber which contains no styrene at all has been successfully produced on a pilot-plant basis. (See appendix.)

While we do not consider ourselves experts on synthetic rubber, the above would indicate a strong possibility of using GR–S formulations containing less than 23 percent styrene. As figures in the appendix will show, if the average styrene content of GR–S were dropped from 23 to 17.6 percent, there would be sufficient styrene to supply the entire 726,300 tons of GR–S programed and also meet all forecast polystyrene demands as shown in the trend line in chart A. We feel a reduction in the styrene content of GR–S should be seriously considered.

2. *Adjust GR–S production timetable.*—The scheduled production of GR–S will impose a shortage of polystyrene on the injection molders. While the shortage will be acute in the first half of 1951, if the production of GR–S is stepped up to its scheduled high level in the second half of 1951, the shortage will become increasingly acute. However, the prospect of an increase in the production of styrene by the producers of this chemical may alleviate the situation in the second half of the year.

With the prospect of an increase in the output of styrene in the second half of 1951, the most critical problem which confronts the injection molders is the first half of 1951.

From information we have received we understand that the production of GR–S in the months of November and December was behind schedule. We further understand that early in 1951 the production of GR–S may not go forward according to the schedule. Under these circumstances we feel it would be a good idea for Rubber Reserve to reestablish the schedule on a basis conforming with the more up-to-date information.

By making a small adjustment in the schedule for producing GR–S in the first 6 months of 1951, ti will be possible to partially alleviate the critical shortage that will confront the injection molders during this period and at the same time only slightly adjust the total quantity of GR–S to be produced during 1951. By slightly revising the rate of production of GR–S in the first 6 months of 1951, the requirements of the rubber industry will be taken care of and the injection molders will be able to operate at a rate above their break-even point.

The suggested revision will only reduce the amount of new rubber to be available during 1951 by 2½ percent. The quantity of GR–S to be available will be reduced by less than 6 percent. Such a small revision as this will keep the injection molders and other users of styrene in business.

The suggestion is set forth in the table below:

1951 GR–S production

[Long tons]

	Present schedule	Suggested schedule		Present schedule	Suggested schedule
January	54,800	50,000	November	62,500	62,500
February	52,000	50,000	December	62,500	62,500
March	57,000	50,000			
April	62,500	50,000	Total GR–S	726,300	684,000
May	62,500	52,000	Natural rubber imports expected	900,000	900,000
June	62,500	57,000	Other synthetic rubber (ea.)	100,000	100,000
July	62,500	62,500			
August	62,500	62,500	Total net rubber	1,726,300	1,684,000
September	62,500	62,500			
October	62,500	62,500			

Suggested schedule reduces total new rubber by 2.5 percent, GR–S by 5.8 percent.

If this suggested revision in the GR–S production timetable is adopted and if the expected increases in total styrene production occur in the second half of the year, the extent to which the drastic polystyrene shortage will be relieved is shown on chart D. Although this relieves the situation somewhat, you will note that it allows for no continuation of the expected growth in polystyrene demand.

To show further what little effect the suggested revision will have on the total availability of new rubber we have included chart E.

Since the above suggestion involves changes in the rate of production of GR–S in the first months with additional supplies of styrene becoming available in the second 6 months, table I has been prepared to show the effects of the change. As this table demonstrates, the present schedule for the production of GR–S would in the first half of 1951 cut the injection molders back to 72 percent of the present rate of operation. By making the suggested revisions in the rate of producing GR–S, the injection molders would be enabled to operate at 85 percent of their present level of operations. While this will be a substantial cut, and while it will not enable the injection molders to experience the rate of growth which they have been enjoying, the adjustment will enable most of them to avoid losses and possible economic collapse.

OTHER SUGGESTIONS

The above suggestions have both been aimed at relieving the short-term material shortage problem faced by injection molders. The committee has two other suggestions to offer.

1. *Speed defense orders for molded parts.*—We are informed that the Armed Forces are considering many military items which will include injection molded parts. The committee urges that the Armed Forces place orders for these injection molded items as soon as possible. Such orders would enable the injection molders to operate at a high enough rate to maintain their plants in being and retain trained personnel.

2. *Raw materials.*—Beyond the short-term material shortage which is the major reason for this report, the committee recognizes that there is a serious long-term shortage problem in raw materials basic to the plastics industry. The most critical of these is benzene, which is basic to both the synthetic rubber and plastics industries.

Up to the present there has been sufficient benzene so that the production of plastic materials and synthetic rubber has not been seriously hampered. However, no expansion in the production of these materials can be contemplated without development of additional benzene supplies. It is obvious that no large additional supply can be expected from the coking of coal and that imports are not a satisfactory answer.

Therefore, this committee strongly urges that the Office of Rubber Reserve take all steps possible to increase the production of benzene from petroleum sources and any other sources which may be deemed practical.

CHART D

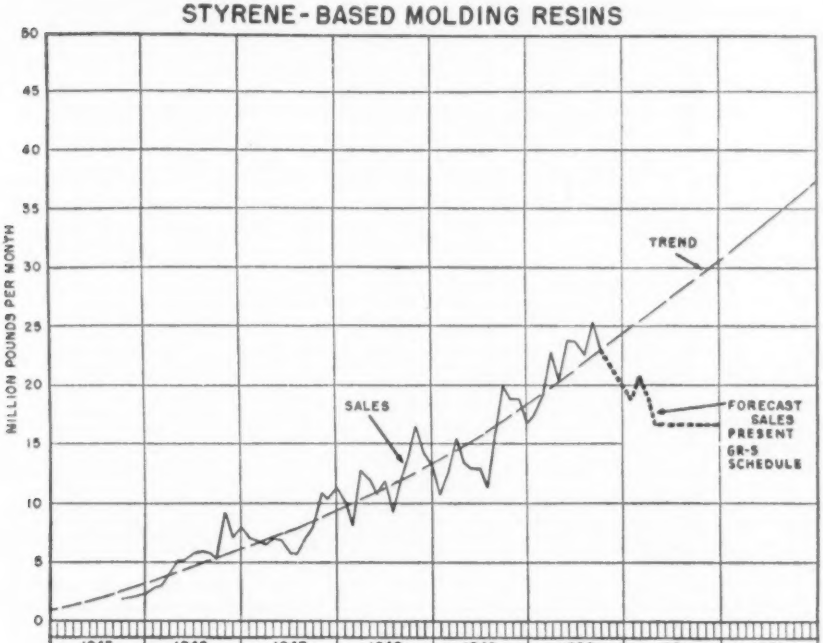
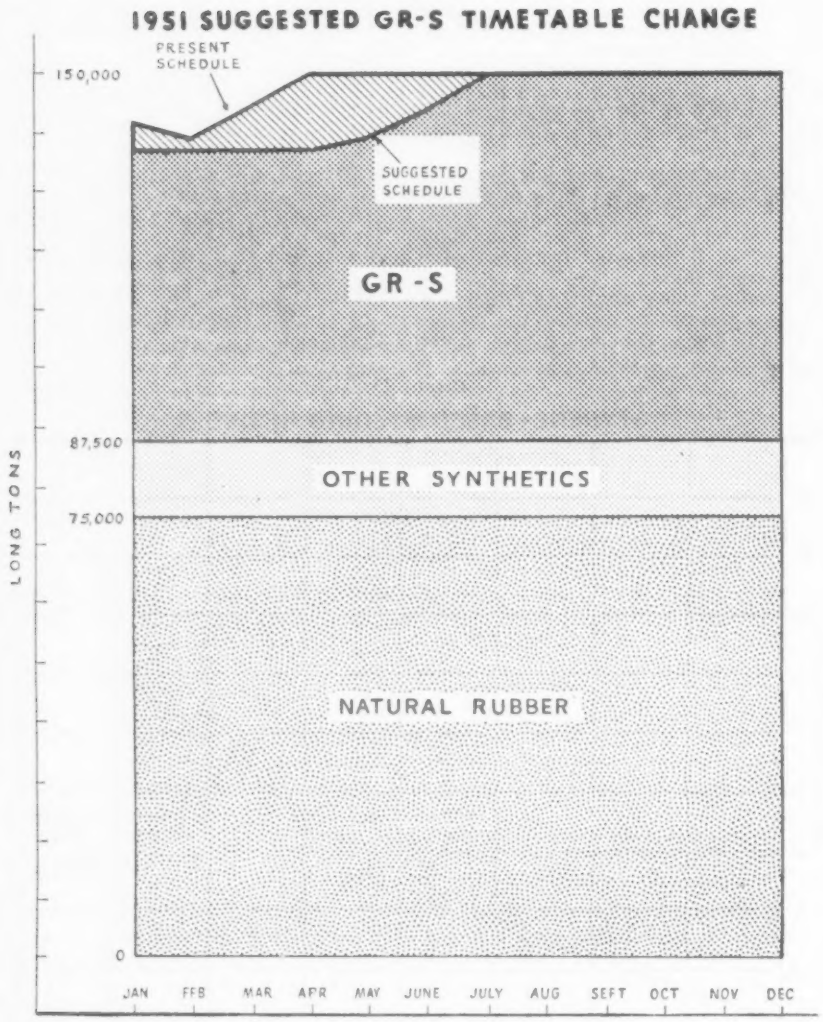


CHART E



NATURAL RUBBER IMPORTS AND SYNTHETIC PRODUCTION FIGURES BASED ON INFORMATION FROM OFFICE OF RUBBER RESERVE AND OTHER GOVERNMENT SOURCES.

TABLE 1.—*1951 styrene distribution (short tons)*

	Styrene production	Styrene to GR-S	To polystyrene and all other uses	Styrene needed for polystyrene and all other uses	Percent of indicated operation for injection molders and other uses
Present schedule:					
First half	160,000	93,150	66,850	[1] 93,000	72
Second half	160,000	98,700	61,300	93,000	66
Total	320,000	191,850	128,150	186,000	69
Possible schedule (with indicated additional styrene):					
First half	160,000	93,150	66,850	93,000	72
Second half	186,000	98,700	87,300	93,000	94
Total	346,000	191,850	154,150	186,000	83
Proposed schedule change:					
First half	160,000	81,300	78,700	93,000	85
Second half	186,000	98,700	87,300	93,000	94
Total	346,000	180,000	166,000	186,000	89.5

[1] 1951 estimated requirement (based on current operating rates): Polystyrene, 150,000; other uses, 36,000; total, 186,000.

CONCLUSION

In conclusion the committee makes two suggestions for alleviating the short-term polystyrene shortage problem which confronts the injection molders.

1. Revise downward the styrene content of GR–S.
2. Adjust the GR–S production schedule for the first half of 1951.

In addition, the committee has made two other suggestions:

1. Speed defense orders for injection molded parts.
2. Develop additional benzene supplies.

In this report the committee has dealt with the problem the shortage of polystyrene imposes upon the injection molders. The shortage of styrene also affects other branches of the industry. Those companies which produce plastic products made by the low-pressure-molding technique depend upon polyester resins, one of the principle components of which is styrene.

The committee respectfully trusts that you and the administrative officials who are concerned with the injection molders' problem will be able to make use of the material included herewith along with the suggestions to take steps which will lead to relieving the acute shortage problem which confronts the injection molders.

In considering the means whereby the hardship that confronts the injection molders might be relieved, the committee has continuously endeavored to arrive at a solution which would not involve the need for the imposition of any controls They did so having in mind the cumbersome, costly, administrative problem which controls involve, and the attitude of the Government to avoid controls if possible.

Respectfully,

INJECTION MOLDERS' COMMITTEE ON NATIONAL SECURITY,
WM. T. CRUSE, *Secretary.*

APPENDIX B

Expected styrene situation under present GR–S schedule

[Short tons per month]

	Scheduled GR–S production (long tons)	Expected styrene production	Styrene to GR–S	Styrene for injection molding	Styrene for other uses
1951—January	54,800	26,700	[1] 15,100	9,350	2,250
February	52,000	26,700	13,700	10,500	2,500
March	57,000	26,700	15,000	9,430	2,270
April	62,500	26,700	16,450	8,260	1,990
May	62,500	26,700	16,450	8,260	1,990
June	62,500	26,700	16,450	8,260	1,990
July	62,500	[2] 31,000	16,450	11,750	2,800
August	62,500	31,000	16,450	11,750	2,800
September	62,500	31,000	16,450	11,750	2,800
October	62,500	31,000	16,450	11,750	2,800
November	62,500	31,000	16,450	11,750	2,800
December	62,500	31,000	16,450	11,750	2,800
Total	726,300	346,200	191,850	124,560	29,790

[1] Includes 700 tons of styrene to build inventories.
[2] The styrene capacity increase will probably not all take place in a single month as shown, but will be spread over the summer months.

Expected situation should all polystyrene demands be met

[Short tons per month]

	Expected styrene production	Injection molding styrene demand [1]	Styrene demand for other uses [2]	Styrene left for GR–S	Present scheduled GR–S production (long tons)	Percent styrene in GP.–S
1951—January	26,700	12,500	3,000	11,200	54,800	18.5
February	26,700	12,750	3,050	10,900	52,000	19.1
March	26,700	13,000	3,100	10,600	57,000	16.9
April	26,700	13,250	3,150	10,300	62,500	15.0
May	26,700	13,500	3,200	10,000	62,500	[3] 14.5
June	26,700	13,750	3,250	9,700	62,500	14.1
July	[3] 31,000	14,000	3,300	13,700	62,500	19.9
August	31,000	14,250	3,350	13,400	62,500	19.5
September	31,000	14,500	3,400	13,100	62,500	19.1
October	31,000	14,750	3,450	12,800	62,500	18.6
November	31,000	14,750	3,500	12,750	62,500	18.5
December	31,000	15,000	3,550	12,450	62,500	18.1
Total	346,200	166,000	39,300	140,900	726,300	17.6

[1] Based on trend line in chart A.
[2] Estimated, based on current market information.
[3] The styrene capacity increase will probably not all take place in a single month as shown, but will be spread over the summer months. Hence the percentages for May and June as shown are probably low, and the percentages for July and August somewhat high.

Expected styrene situation with suggested GR–S schedule revision

[Short tons per month]

	Revised GR-S production schedule (long tons)	Expected styrene production	Styrene to GR-S	Styrene for injection molding	Styrene for other uses
1951—January	50,000	26,700	13,150	10,930	2,620
February	50,000	26,700	13,150	10,930	2,620
March	50,000	26,700	13,150	10,930	2,620
April	50,000	26,700	13,150	10,930	2,620
May	52,000	26,700	13,700	10,480	2,520
June	57,000	26,700	15,000	9,440	2,260
July	62,500	[1] 31,000	16,450	11,730	2,820
August	62,500	31,000	16,450	11,730	2,820
September	62,500	31,000	16,450	11,730	2,820
October	62,500	31,000	16,450	11,730	2,820
November	62,500	31,000	16,450	11,730	2,820
December	62,500	31,000	16,450	11,730	2,820
Total	684,000	346,200	180,000	134,020	32,180

[1] The styrene capacity increase will probably not all take place in a single month as shown, but will be spread over the summer months.

1951 rubber availability and forecast use

	Thousand long tons		
	Total new rubber	Natural rubber	Synthetic rubber
Available	1,824	900	924
Consumption:			
Military	120	36	84
Civilian:			
Transportation	744	296	448
Nontransportation:			
Latex	75	75	----
All other	324	129	195
Total consumption	1,263	536	727
Added to stockpile	561	364	197

Source: Analysis of the 1951 Rubber Problem, Rubber Manufacturers Association report to the National Production Authority, Oct. 24, 1950.

[From Chemical Engineering, September 1950]

STYRENELESS RUBBER—FIRST SUCCESSFUL PRODUCTION OF A POLYBUTADIENE RUBBER FOR TIRE TREADS COMES AS NATURAL RUBBER PRICES SOAR AND BENZENE, VITAL STYRENE RAW MATERIAL, IS SCARCE

A new synthetic rubber, made without critically short styrene, has been developed by Phillips Petroleum Co. in cooperation with the Office of Rubber Reserve. During June approximately 475,000 pounds of the new rubber, called polybutadiene or PB rubber, was produced in the Borger, Tex., copolymer plant operated by United States Rubber Co. for Rubber Reserve. This rubber was made to duplicate limited quantities of the material previously made by Phillips in its cold rubber pilot plant. Phillips technical men assisted in the production at Borger. Limited road tests indicate that the new rubber is superior to GR-S synthetic rubber; it is about as good as cold rubber for tire tread use, which, of course, means that it is superior to natural rubber.

"Skyrocketing prices of natural rubber," says President K. S. Adams of Phillips, "have rapidly increased demand for GR-S synthetic rubber, which is made from a mixture of butadiene and styrene. However, there is a critical shortage of benzene from which styrene is made. Consequently, the Government has not been able to supply the demand for GR-S synthetic rubber."

The new rubber requires no styrene since it is made for butadiene. The production of butadiene, made from petroleum, can be increased in existing plants to meet the present heavy demand for synthetic rubber.

Previous efforts to make polybutadiene synthetic rubber commercially were unsuccessful because the rubber obtained was difficult to process and had poor physical properties. Polybutadiene rubber good enough for use in tires was finally obtained in Phillips Petroleum Co.'s laboratories by making it much softer than usual with a modified recipe and at moderately low temperatures.

In the new process, high abrasion furnace carbon black is mixed with the polybutadiene latex before conversion to solid rubber. The PB rubber process is relatively straightforward and can be carried out in conventional production lines for cold rubber. In capsule, here's how the process works. Butadiene is mixed with soap and run into a jacketed reactor cooled with methanol. In the refrigerated reactor, butadiene is polymerized at 86° F., using an activated recipe similar to the well-known cold rubber custom recipe. The reaction takes about 10 to 12 hours. Next, the material is blown down under vacuum. Since no styrene is used, the monomer recovery or stripping step is greatly simplified, and it would be expected that production of 86° F. PB rubber could considerably exceed GR–S production in similar equipment. Thus PB rubber may help relieve the synthetic rubber shortage through decreased requirements for styrene and through increased capacity in the copolymer plants.

After blow-down, the latex is blended with antioxidant, creamed in brine, coagulated in dilute sulfuric acid, dewatered, reslurried, and filtered. Then it is conveyed to a disintegrating mill, from which it goes to a circulating air dryer. Finally, it is baled hydraulically.

One of the best features of the new product is its outstanding processing characteristics. It can be mixed and extruded at lower temperatures and with lower power requirements than GR–S, cold rubber, or natural rubber, and it is unusually safe from the standpoint of scorch characteristics. It is believed that the new product will have its greatest utility in tire treads, probably in blends with cold rubber.

PB rubber, then, is a butadiene polymer prepared at 86° F. to a Mooney value of about 25 and latex masterbatched with HAF black (Philblack O). It represents the first successful effort to produce a polybutadiene rubber suitable for commercial use in tire treads.

[From the Journal of Commerce, October 16, 1950]

Synthetic Rubber Output Will Overshoot Needs, Mobilization Chiefs Hint—100,000-Ton Excess in 1951 Looms; Civilian Cut-backs Big Factor

(By Arthur K. Kraft, Washington Bureau)

Washington, October 15.—Mobilization planners are beginning to worry over the prospect that their fast build-up of synthetic rubber production is going to hand the country a good deal more synthetic than it can use without a full-scale war.

They will probably know for sure by next spring, when the annual rate of United States production is likely to have doubled to 900,000 long tons. The trouble is that industry cannot use nearly that much unless a new war chokes off the huge inflow of natural rubber from Southeast Asia.

HURRIED INTO ACTION

The expansion plans were devised hurriedly last summer when there seemed a good chance that the Communists might engulf the Asiatic rubber-growing areas. That would have further fouled up an already alarming supply outlook.

The mobilization planners are not sorry they reacted in the expected way—by slamming all the Government's synthetic rubber plants back into production. But these facts are staring them in the face:

1. By March or April our supply of all rubber will probably be running at close to a 2,000,000-ton annual rate (850,000 tons from Government synthetic plants, 750,000 from Asia, 100,000 from makers of specialty synthetics, and a large but undetermined amount fromreel aimers).

INDUSTRY USE LIMITED

Industry is sure it can use only about 1,200,000 tons of natural and synthetic under present and foreseeable conditions—less if steel shortages cut back automobile production.

3. Of that amount, United States manufacturers insist that no more than 720,000 tons can be synthetic rubber without taking the economically wasteful course of reducing the quality of its rubber products by mixing in too much synthetic.

Since production of synthetic rubber cannot be turned on and off like a spigot, and manufacturers cannot alter their product mix readily, the probable surplus of synthetic next year is estimated at about 100,000 tons, leaving specialty grades and reclaim out of the picture.

The defense stockpile and industry will each take about half of the imports of natural rubber. That is the most optimistic forecast, based on continued high natural rubber imports and record rubber-manufacture levels.

PROBLEM WILL WORSEN

The closer the Munitions Board comes to reaching its 1,000,000-ton natural rubber stockpiling goal, now dated "some time in 1952," the worse the synthetic surplus problem is going to get.

Neither type of rubber can be stored indefinitely, and to keep its crude rubber stockpile in good condition the Government will have to rotate large amounts of it. That means pressure on industry to absorb tonnages well above its present capacity.

What to do with the surplus? One Washington official, perhaps only half in jest, believes we might "dump it into the Potomac."

The hard fact, as expressed by a top mobilization planner, is this: "We've been very short on rubber, and our stockpiling program has been inexcusably slow until recently. But next year and after, we'll have a surplus—and of the wrong kind of rubber."

FULL SUBSTITUTE DESIRABLE

It's the wrong kind because rubber preparedness requires stockpiling of natural rubber, the kind we can't get when war breaks out. We're pushing synthetic production to the limit and will keep it there, as an insurance policy for any eventuality. We don't want to accumulate unused stores of synthetic rubber with with Government production constantly rolling at capacity.

The obvious solution, then, is for industrial rubber consumption to rise quickly beyond its present 1,200,000-ton annual rate and for science to develop overnight a new synthetic which can take the place of natural rubber completely.

Like most pat solutions, this is easier said than done.

PLAN TIGHTER CURBS

To Mobilization Boss W. Stuart Symington and Senator Lyndon B. Johnson, Democrat of Texas, chairman of a Preparedness Subcommittee that helped prod the planners into opening up on rubber production, the course ahead looks pretty much like this:

Present Government controls requiring industry to use minimum quantities of synthetics must be tightened to force-feed our huge synthetic production into rubber goods. Industry, now using almost as much synthetic as natural, says it can use no more than 60 pounds of synthetic to 40 of natural.

But when the Government's synthetic production is at capacity next spring, industry can expect to be rolled back to a 70–30 or 80–20 ratio through controls as stringent as those of the last war. Among other things, this would mean almost 100 percent synthetic rubber passenger car tires sometime next year. New rubber in the present tire is about 64 percent synthetic.

MAY SWAP WITH EUROPE

The controls are being tightened already to conserve natural rubber for stockpiling in the face of a not yet overcome shortage of synthetic. They will be spelled out through end-product restrictions this fall.

To move some surplus synthetic we will try to swap it for natural rubber held by Western Europe. This would help fill our natural rubber stockpile and could lessen the need for severe curtailment of natural by United States industry.

A third proposal is to build up a large working inventory of synthetic here—stock a little more than we use. No one has suggested stockpiling synthetic with production at full blast.

None is as simple as it appears. Complicating these solutions is the necessity for increasing the price of Government synthetic. About one-third of the total 760,000 tons of general-purpose rubber will cost 40 to 50 cents a pound to make compared with 18.5 cents cost of the balance. If averaged, the price will be 23 to 25 cents across the board.

MARKET MAY TUMBLE

How the natural rubber market will react to a huge production of synthetic rubber by its chief customer is another puzzler. Some think the market will tumble; no one thinks it can maintain its current 50- to 60-cent range.

History shows that when the crude rubber market is down, Far East production falls also as small producers take to the jungles to fill the family rice pail with the proceeds of banditry. Bandit activity plays havoc with production in the large estates, further reducing supply.

Such a turn of events would mean tighter controls of industrial use and for a longer duration, since nothing will stop the speedy acquisition of crude rubber for the stockpile, according to a top official. The fear of encouraging communism in the rubber-growing area is also the argument for not imposing a price ceiling on crude rubber.

Other draw-backs are:

If the price of natural rubber skids, American industry could hardly be expected to accept graciously a Government mandate forcing it to use a more costly raw material than obtainable on the free market, particularly since its best minds feel certain that the use of too much synthetic would result in such poor products that its customers will howl.

Western Europe's factory managers, likewise, will be loath to swap crude rubber, which they prefer to use, for American surplus of synthetic. They might be wheedled into doing this on a small scale only if Europe can buy synthetic much cheaper than natural, making dollars on a ton-for-ton swap.

EUROPE MAY BALK

However, there is some thought being given to selling to Europe the 40- to 50-cent alcohol butadiene-base synthetic to avoid raising the price to domestic users. If the price of crude rubber drops significantly, Europe probably won't be talked into a swap.

The argument will be put forth to Europe that we are in the mobilization effort together and Europe must learn to work with synthetic against the day when war cuts off its crude rubber supply. But Europe has not yet shown enough mutual-aid spirit to warrant high hopes that it will swallow this.

[From the New York Herald Tribune, October 17, 1950]

DEFENSE CUTTING INTO PRODUCTION OF POLYSTYRENE—MOLDERS SEEN TURNING TO INFERIOR SUBSTITUTES

(By Max Forester)

Opening of the first of several synthetic rubber plants to be reactivated under the defense program last week marked the start of a huge withdrawal of styrene monomer, the principal raw material used in making polystyrene plastics.

Consequently the major producers of polystyrene—which now accounts for 25 percent of all molded plastics tonnage—are planning cut-backs in output of the plastic. While there will be ample supplies for military uses, molders' supplies will be sharply reduced and the industry taxed to cope with the situation.

Definite figures on the extent of the anticipated cut became available yesterday from one of the leading producers. With output of all producers now running at 22,000,000 pounds a month, production is expected to be reduced to about 15,000,000 pounds a month by early next year.

POLYSTYRENE A TOP SELLER

Polystyrene molding materials have shown the fastest rate of growth of any of the several types of base materials used by the mushrooming plastic industry, and the tonnage used has been closely rivaling phenolics resins and vinyl resins, the other two top sellers. Vinyl resins are not widely used for molding purposes.

The rapidity of their growth is evidenced by a rise in their production rate from approximately 28,000,000 pounds for the entire year 1945 to the present rate of about 264,000,000 pounds annually. This was accomplished by using part of the vast facilities for producing styrene which were developed for synthetic rubber making in World War II, improving the characteristics of the polystyrenes then available and aggressively merchandising new ones to the industry.

PRODUCT MUCH IMPROVED

Increased resistance to temperature changes, improved behavior of the material in the molding so that crazing and other hindrances were eliminated, and wider color ranges built into these materials went far to better the all-round performance of rigid plastic items in general, and these factors have been responsible in large part for the continued gains made by the industry as a whole during the last several years.

Nearest to polystyrene, in many physical respects, are the cellulosic plastics, whose producers have themselves just announced cuts in allocations ranging from 20 to 30 percent, because of reduced supplies of cotton linters and wood pulp. It seems likely that many molders will be forced to fall back on the urea formaldehyde and phenolics types that have less desirable performance characteristics in many present polystyrene applications.

PHENOLICS SCARCITY SEEN

Phenolics, in turn, may be in short supply because of anticipated diversions of benzene. Producers of phenolics, however, have not yet been able to estimate the extent of anticipated cuts.

Chief producers of polystyrene are Dow Chemical Co., Monsanto Chemical Co., Bakelite division of Union Carbide & Carbon Corp., and Koppers Co. These companies still are allocating stocks to customers on the basis of 100 percent of past usage, but reductions in the percentages furnished are expected soon. Evidencing the faith of producers in continued growth for polystyrene materials, one company, Dow, still is expanding its facilities for formulating the molding powders, even in face of the shortage of styrene.

[From the Journal of Commerce, October 20, 1950]

TRENDS IN SUPPLY AND DEMAND—SEE AMPLE RUBBER PRODUCT OUTPUT

Barring intensification of the international situation, manufacturers probably will be able to product enough rubber products to satisfy the needs of the American consumer. This should be possible despite the restrictions on rubber consumption and the impact of military requirements on the industry's facilities.

CURRENT CONDITIONS

In recent months the output of rubber products has been exceptionally high, dealers have been building inventories and consumers have been buying in abnormally large quantities.

At first the brisk demand resulted from higher natural rubber prices, subsequent expectation of increased rubber product prices, and consumer desire to avoid the price rises. The demand was further bolstered by outbreak of war in Korea and a resultant wave of scare buying.

A second round of Government consumption restrictions is now pending. Intended to compensate for a previous failure to limit new rubber consumption and build up the strategic stockpile, an order fixing industry consumption at 51,000 long tons of natural rubber in November and 45,000 tons in December is now reported imminent.

Total combined use of natural rubber, including latex, and of synthetic is to be fixed at 84 percent of the monthly average during the year ended June 30,

1950. This would bring industry consumption of new rubber for use in civilian production to about 91,500 tons a month.

An earlier act, effective September 1, attempted to limit new rubber use to 90,000 tons a month but failed because of hardship appeals by smaller manufacturers. Consumption in September actually hit 109,000 tons. The previous order also neglected to make provision for the consumption of latex.

Although the rubber industry can no longer produce at the peak levels of last summer, 90,000 tons of new rubber per month are more than adequate to meet the normal demand of American consumers for rubber products.

Furthermore, any defense orders for rubber products placed by the Government are accompanied by permission to exceed the consumption limitations of the new order. Therefore, a manufacturer is allowed to procure additional amounts of rubber exclusive of his quota if he is engaged in filling a defense order.

Rubber industry officials expect that a new order imposing tighter restrictions on new rubber consumption will be enacted by the first of next year. However, it is likely that this order will deal with the consumption ratio between synthetic and natural rubber rather than a drastic cut in new rubber consumption.

POTENTIAL SUPPLY

Even if the Government cuts industry consumption of new rubber still further, it is likely that rubber products will continue to be produced in quantities large enough to meet normal consumer demand.

At 90,000 tons per month consumption, the Nation's manufacturers will use 1,080,000 tons a year. In 1946 and 1948, when the Nation's consumers were buying rubber products in large quantities to make up for the scarcity during the war, consumption of new rubber totaled 1,039,300 tons and 1,069,400 tons, respectively.

In 1949, with the wartime shortages finally alleviated and consumer buying back at normal levels, consumption amounted to only 988,400 tons.

Thus there is plenty of leeway remaining for consumption cuts in new rubber. If consumers buy only what they actually need and do not engage in precautionary purchasing, the rubber industry should not require more than 1,000,000 tons of new rubber at the most.

This would leave considerable amounts of new rubber for the Government stockpiling program and for essential defense orders.

As the year's end approaches, more and more rubber products will contain greater quantities of synthetic rubber. Reactivation of the Nation's synthetic rubber production facilities has been on a large scale.

By the first of next year it is expected that the synthetic output will be at an annual rate of better than 650,000 tons. During 1951 this will increase to an annual rate of better than 900,000 tons.

With synthetic rubber selling at 18½ cents a pound for GR-S, manufacturers will tend to substitute larger quantities for natural rubber, which currently sells at about 55 cents a pound. Furthermore, Government orders are expected to force increased use of synthetic if the price differential fails to work to that conclusion.

Most rubber products will give equal performance with larger percentages of synthetic in their composition. Since the last war, when synthetic rubber grew from infancy to semimaturity, many improvements have been made in quality and performance. Industry officials are sure that synthetic rubber products will give excellent performance to the American consumer.

PROSPECTIVE DEMAND

Demand for rubber products is not expected to be very brisk in the months ahead. Most consumers have adequate supplies of the rubber products they require. Unless another wave of scare buying occurs, there should be adequate stocks of rubber products on dealers' shelves.

Military demand for rubber products will increase in intensity, but raw material stocks are sufficient to insure that defense requirements will not interfere with normal consumer supplies.

PRICE OUTLOOK

Rubber product prices may ease with the increased use of synthetic rubber by manufacturers. Furthermore, as synthetic rubber production and use increase, natural rubber prices may tend lower.

Deterioration of the international situation or a pronounced increase in labor costs would tend to counteract any price easiness based on these factors, however.

[From the New York Times, October 17, 1950]

UNITED STATES POLICY ON RUBBER ASSAILED AS "JITTERY"

Hysteria is rapidly becoming the guiding force of the Government in its control of rubber and the rubber industry, it was charged yesterday by Harry E. Humphreys, Jr., president of the United States Rubber Co. His accusation was prompted by reports that the Government may soon announce a new order cutting further the use of new rubber.

"If the Government, prior to the time when synthetic rubber production comes into large volume, reduces further the amount of new rubber that can be used in civilian products, then the Government is going to bring on more shortages. This in turn will bring more scare buying, higher prices, greater inflation, shorter working hours, less take-home pay, and other evils.

"I recognize that the limitation of rubber consumption which has already been ordered and that which is contemplated stems from the Government's desire to build up the Nation's stockpile of natural rubber for security purposes. I believe always in putting our country's defense and security ahead of civilian wants and needs, but in my opinion this can be done with judgment rather than jitters."

With natural rubber coming in faster than at the time the program was drawn up, Mr. Humphreys explained, the Government should speed up synthetic production by stepping up output of essential components which are in short supply.

INJECTION MOLDERS' COMMITTEE ON NATIONAL SECURITY

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